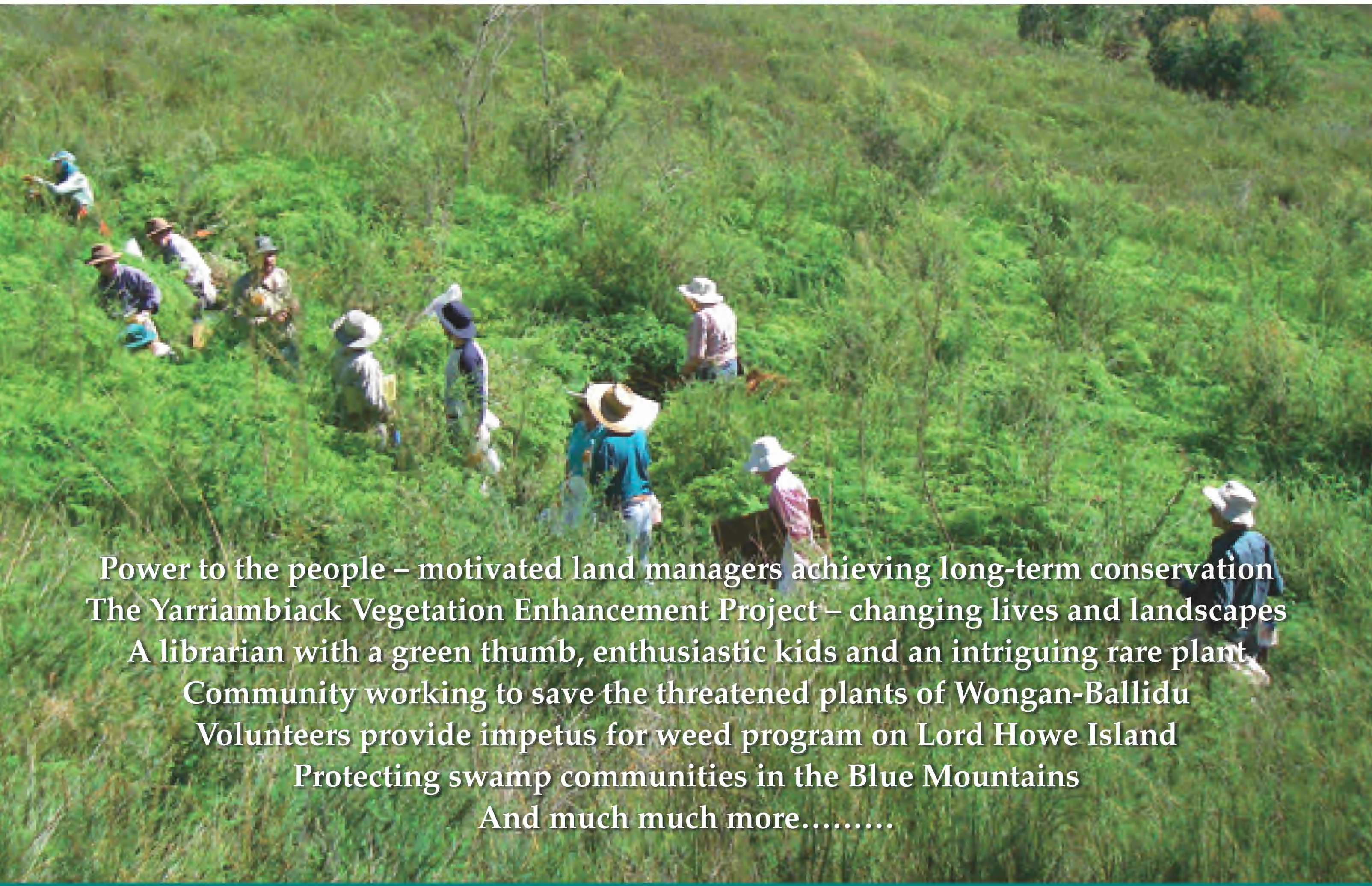
Australasian Plant Conservation

BULLETIN OF THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION INC

VOLUME 16 NUMBER 2 • SEPTEMBER - NOVEMBER 2007



Power to the people – motivated land managers achieving long-term conservation
The Yarriambiack Vegetation Enhancement Project – changing lives and landscapes
A librarian with a green thumb, enthusiastic kids and an intriguing rare plant
Community working to save the threatened plants of Wongan-Ballidu
Volunteers provide impetus for weed program on Lord Howe Island
Protecting swamp communities in the Blue Mountains
And much much more………

SPECIAL THEME: COMMUNITY ACTION FOR PLANT CONSERVATION

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Australasian Plant Conservation

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Australasian Plant Conservation is produced by the ANPC Inc. with assistance from the Australian National Botanic Gardens.

Australasian Plant Conservation is printed on recycled paper.
ISSN 1039-6500

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Mission Statement

"To promote and improve plant conservation"

Contributing to *Australasian Plant Conservation*

Australasian Plant Conservation is a forum for information exchange for all those involved in plant conservation: please use it to share your work with others. Articles, information snippets, details of new publications or research, and diary dates are welcome. **The deadline for the December 2007 - February 2008 issue is 30 November 2007.** The December-February issue will be on the special theme of 'Conservation of Buttongrass Communities'. However, general articles are also very welcome. Please contact Tom May if you are intending to submit an article: tom.may@rbg.vic.gov.au.

Authors are encouraged to submit images with articles or information. Please submit images as clear prints, slides, drawings, or in electronic format. Electronic images need to be at least 300 dpi resolution, submitted in at least the size that they are to be published, in tif, jpg or gif format. Guidelines for authors are at: http://www.anpc.asn.au/anpc/pdffiles/APCGuideContrib.pdf.

Please send articles, no more than 1100 words, as a MS Word (2000 compatible) or rich text format file, on disk or by email to: tom.may@rbg.vic.gov.au.

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Front cover: (L-R) Friends of Lord Howe Island volunteers; Photo: Ian Hutton. Sunshine Street Bushcare members planting out nursery stock, Culburra Beach, NSW; Photo: Kerry Thompson. Volunteers at Yarrilinks 2007, Broombush site in the Wimmera, Vic; Photo: Adrian Tyler; Volunteers removing Tutsan and Himalayan Honeysuckle, Blue Mountains, NSW; Photo: Michael Hensen.
Cover design: Siobhan Duffy.
Printed by: Goanna Print, Canberra.

President's Report: community action for plant conservation

Judy West

Centre for Plant Biodiversity Research, CSIRO Plant Industry

The ANPC continues to link on-ground plant conservationists with scientific outcomes of recent research through workshops and training courses. The Coordinator, Sally Stephens, is finalisng arrangements for a course to be held in the ACT on November 22 and 23. The focus of this course is identification of plants of grassy ecosystems, with both theoretical and practical field activities covering techniques used for identification, spot characters to recognise families and genera, and awareness of resources available. Participants should improve their skills in identifying plants of these endangered ecosystems as well as being better equipped to recognise species indicating conservation value of the site.

The ANPC has secured Envirofund support to run workshops in the Western Australian wheatbelt in March 2008. Two workshops covering rehabilitation and management of disturbed native plant communities will be run in the Wheatbelt Woodlands of the Avon Region and the Northern Agricultural Region.

The ANPC's 7th National Conference is fast approaching. **Our Declining Flora – Tackling the Threats** is the topic of our next conference which should provide opportunity for all those with an interest in threatening processes in plant conservation to present their work, discuss particular topics, interact with others addressing similar issues, and to generally share experiences and information. The conference will be held 21 – 24 April 2008 at Mulgoa in New South Wales (near Penrith, west of Sydney). Please register your interest in attending as soon as possible – see http://www.anpc.asn.au/conferences.html

Many threatening processes affecting plant conservation are addressed through volunteer and community groups in Australia and worldwide. The articles included in this issue of *Australasian Plant Conservation* under the theme of 'Community Action for Plant Conservation' provide some excellent examples of the impact local communities can bring to bear on threats to the integrity of species, ecosystems and landscapes. Community Action programs provide a major boost for plant conservation, not only helping to protect threatened plant species but also raising awareness of the importance of plants and the threats they face.

Many Australians volunteer for community conservation projects in urban, regional and remote Australia, most having an interest in the environment and enthusiasm for conservation. Surveys indicate that volunteers generally wish to give back to their community and to feel they are shaping the future direction of their environment. There are various approaches to the involvement of members of the local community and in the type of plant conservation activities, the most common being weed control, tree planting, and management, rehabilitation and monitoring of native vegetation patches as well as erosion control.

A critical ingredient of successful community projects is collaboration. Since our land is managed by different authorities and is 'controlled' by different jurisdictions it is important for local action groups to work cooperatively with other relevant interest groups. From the Braidwood district of southern New South Wales, **Rebecca Hall** and **Rebecca Bradley** provide here an example of long-term environmental benefits achieved through collaborative efforts of inspired, dedicated, local land-holders and the relevant Catchment Management Authority. Achieving significant revegetation in harsh environments such as the Braidwood granite hilltops requires persistence and determination and for collective targets to be recognised. **Rae Talbot** illustrates the opportunities such collaborations can provide through involving refugee families in the Yarriambiack Vegetation Enhancement Project in Victoria's Wimmera district. In addition to vegetation outcomes the project has provided considerable assistance to farmers and land-holders,

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and, through different nationalities working side by side, much enhanced cultural exchange.

In an article on volunteer involvement in weeding programs **Ian Hutton** demonstrates a novel combination of activities operating on Lord Howe Island. Mobilising the energy of a small population resident on the island to manage and care for their unique ecosystems is assisted through the Friends of Lord Howe Island. Another strategy involves participants from mainland Australia taking part in ecotours, a proportion of the time providing volunteer labour for dealing with weeds. The success of the program and increasing level of knowledge has enabled the teams to tackle weeds on an island-wide scale. Contributing to the success and providing momentum for this well established weed control program are the differing levels of expertise of the various volunteers working cooperatively.

The focus of some community projects brings increased knowledge to local managers with exchange of information and the opportunity to trial different techniques. Protection of swamp communities in the Blue Mountains has entailed trialling a range of innovative techniques to stabilise gully erosion and control water movement, an approach **Anne Carey** describes as soft engineering works. The information gained through monitoring and opportunities to systematically record observations are well illustrated by **Hazel Rath** and **Clive Hurlstone** describing revegetation of the Boboyan Pine Plantation in the ACT. This is a long running large-scale community-driven regeneration program successful through collaborative efforts with the ACT Government and members of the NGO, the National Parks Association of the ACT Inc.

Volunteers across the country are involved in a wide range of activities relating to threatened flora and particularly to individual threatened species in their region. They can be involved in surveying and monitoring plants in threatened populations, or in weed eradication, but also in recording observations on flowering and fruiting phenology, seed germination, pollination and general ecological features of the species, including response to fire or other disturbance factors. Extremely valuable datasets have been developed in this way. The profile of Tasmania's threatened plants has recently increased with the formation of the Wildcare Threatened Plant Action Group (TPAG). **Catriona Scott** indicates that TPAG was formed to encourage and facilitate state-wide community involvement in threatened flora protection and recovery. In this way the jurisdictional authority is able to leverage greater resources and contributions which are essential if we are to address the threats impacting on Australia's threatened flora. The Victorian government has also benefited from significant contributions of the Castlemaine Field Naturalist's Club undertaking surveys of more than 150 cemeteries across central Victoria. **Ern Perkins, Lesley Perkins** and **Deanna Marshall** describe the information recorded, including species present, together with their cover/abundance, and general landuse data. This enhanced information enables the state agency to make better informed conservation decisions and to categorise the cemeteries according to their ability to act as refuges for threatened species and sources for genetic material.

Increased knowledge of local assets is the approach taken by the Wongan Ballidu Bushcare group in W.A. to raise the profile of threatened plants in the district. Involving the local school as well as the state conservation agency and local enthusiasm improves the general level of information and specifically of some Declared Rare Flora. **Sonya Thomas'** description of observed population changes due to drought conditions emphasises the importance of local communities monitoring developmental change. **Deanna Marshall** explains the role an enthusiastic conservationist and the local primary school played in improving our understanding of germination of a threatened flax-lily in Victoria. A high proportion of Australia's orchids have restricted distributions and many are recognised as rare or threatened under state or commonwealth legislation. The decline in quality of orchid habitats and loss of species and populations inspired the Victorian branch of the Australasian Native Orchid Society to take action. **Andrew Dilley** puts forward some orchid case studies involving survey and monitoring, active management practices, translocation experiments and establishment of *ex situ* populations.

Community projects can play a considerable role in raising awareness of local natural assets to landholders and others in the region. **Sally Mathews** and **Justin Couper** write of the habitat recovery project related to the recently discovered threatened species Moonee Quassia in northern NSW. An environmental project of this proportion demonstrates the benefits of cooperative efforts from community based organisations, land holders and NGOs working with the directions and guidelines of a threatened species recovery plan.

The increased scientific knowledge gained by the community volunteers from involvement in projects like the Moonee Quassia emphasises the importance of basing plant conservation activities on sound scientific principles. **Kerry Thompson** of the Shoalhaven Volunteer Community Nursery relates the experience of a community group turning a vision into a practising nursery, established to assist in the conservation of natural areas of the Shoalhaven region in south-eastern NSW. Plants are propagated for local use and the community is building up a compendium of knowledge on propagation techniques to pass on to others.

Power to the people – motivated land managers achieving long-term conservation

Rebecca Hall & Rebecca Bradley

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Community conservation can be expressed in various ways across the landscape. It may be through urban and rural tree planting, management and/or rehabilitation of native vegetation remnants, bush regeneration, erosion control or feral animal and weed control, or through social awareness-raising events like environmental arts festivals.

Many of these community-based conservation efforts began through motivated and interested individuals or small groups seeking to overcome an environmental issue in their local area. In the Braidwood district of the southern tablelands of NSW, many community conservation projects have evolved to help tackle specific environmental issues.

Dealing with loss of vegetation on erosive, aeolian, sand-deposited hilltops and control of a burgeoning weed problem along sections of the Shoalhaven River are two projects that grew from modest beginnings. Initially, individual landholders attempted to revegetate hilltops or manage riparian weeds. However, the scale of the issues was such that individual efforts alone had limited affect.

These landholders and Southern Rivers Catchment Management Authority (SRCMA) began working cooperatively. The following two projects provide insights and working examples of how collaborative efforts between inspired, motivated and hard-working landholders and CMAs can lead to long-term environmental benefits.

Braidwood Granites Revegetation Project

The Braidwood Granite Basin comprises approximately 40,000 ha of extensively cleared grazing land, with less than 100 ha of remnant bush remaining. Many hilltops within the basin are covered with aeolian sand deposits which are extremely vulnerable to erosion when denuded of vegetation.

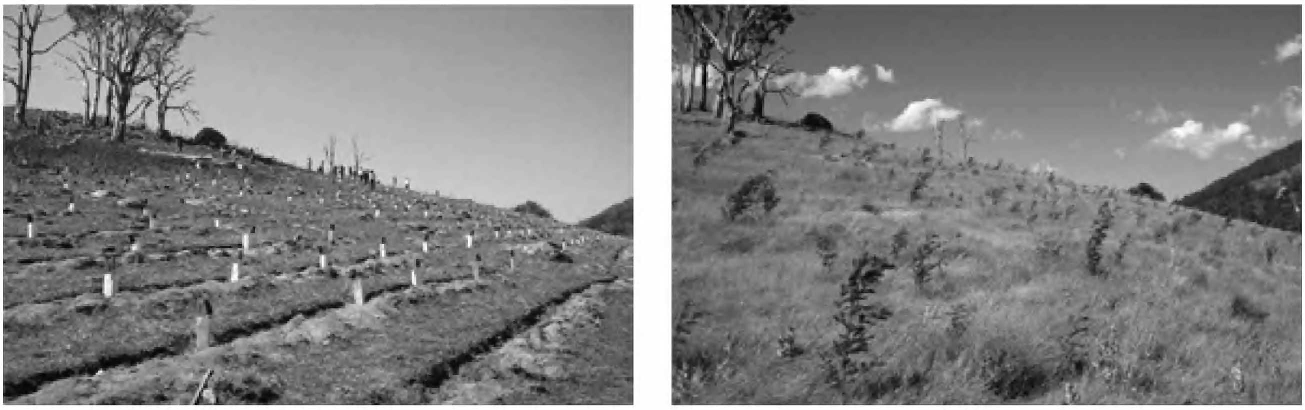
'From little things big things grow' as Paul Kelly sings, and this applies strongly to the evolution of this project. In the 1990s a few local landholders were concerned about the loss of vegetation on these highly erodible hilltops and their potential to 'blow away'. One concerned landholder, Geoff White, encouraged about 10 other landholders to join him in revegetating these areas and so the 'Trees on Rocky Knobs' project was born. As it grew in scope and the number of interested landholders, this project became the Braidwood Granites Revegetation Project.

Aims of Project

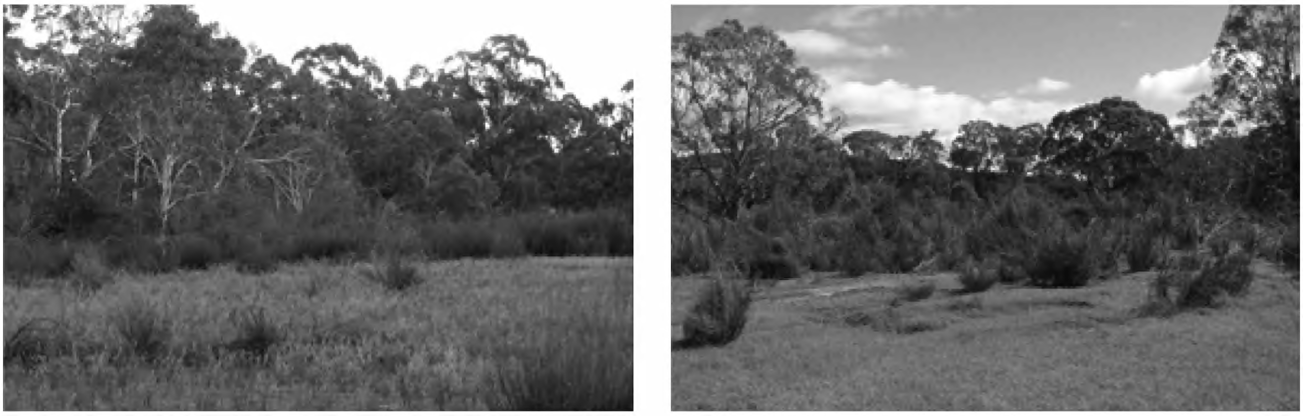
The broad aims of the project are to develop:

- a mosaic of native vegetation covering the Braidwood Granite Basin;
- a more productive farming landscape that is also more resilient to natural disturbances such as drought; and
- a wide recognition of the role and value of native vegetation as an integral part of a sustainable farming landscape.

Since the commencement of the project there have been numerous contributors. The majority of on-ground activities have been completed by participating landholders, members of the Braidwood Rural, Durran Durra and Jembiacumbene Landcare Groups, students from Braidwood Central School, volunteers from the Braidwood community, Greencorps teams and international volunteers organised through Conservation Volunteers Australia. They have sprayed, ripped and mounded the ground, constructed fencing, planted and watered trees and provided on-going maintenance to revegetation areas. At the height of the project, up to 50 different landholders participated in revegetation activities each season (spring to autumn).



Before and after shots of a planting site near Mt Jillamatong, Braidwood, March 2004 and again in December 2005. Approximately 60% survival of 1,200 trees planted during a drought. Photo: David Rush



Before and after shots of broom control on Dempsey property near Braidwood, May 2006 and March 2007. Photos: Rebecca Bradley

What are the results and challenges?

The area of native vegetation on the Braidwood granites has more than doubled since revegetation efforts began, with continued momentum in tree planting.

Establishing new vegetation in an extreme climate has been the project's main challenge. Many landholders, however, still recognise the importance of these activities and continue to participate. Thorough site preparation and maintenance has been an important lesson learnt over time. Spot spraying competitive weeds and ripping and mounding the ground in advance has improved sites for revegetation. High plant survival rates (up to 95% at some sites) have also been achieved by landholders who have watered their seedlings several times after planting.

Project Funding

Funding for the project has been provided through Natural Heritage Trust (NHT) 1, Upper Shoalhaven Catchment Management Committee, Fuji Xerox, Sydney Catchment Authority and the NSW and Australian Governments' NHT 2 through SRCMA.

Shoalhaven River Riparian Weed Management

Sections of the Shoalhaven River are heavily infested with Broom, Serrated Tussock, African Lovegrass and Blackberries. Ten landholders along a 30 km stretch of the Shoalhaven River near Krawaree, had been managing these weeds on their properties in an attempt to reduce infestations and to contribute to overall rehabilitation of the Shoalhaven River. The opportunity to pool their efforts and obtain financial assistance was appealing. So how could this be achieved?

Project Funding

SRCMA's Riparian Partnership Program offers an excellent springboard to link the management efforts of these landholders and the associated environmental gains. SRCMA offers incentives of up to 50% of the cost of weed control, fencing materials and native plant tubestock for two year management programs, with a maximum of $10,000 per year per landholder.

Substantial funds ($170,000) have been made available to the Shoalhaven River Riparian Weed Management Project with the aim of reducing the extent of riparian weeds along the stretch of the Shoalhaven River near Krawaree. The funds will also support rehabilitation activities that include re-introducing native vegetation to river banks.

Main Activities

The participating landholders will assist with activities including:

- spraying Broom, Serrated Tussock, Blackberry and African Lovegrass along the riparian zone of the Shoalhaven River, adjacent floodplain and some tributaries;
- replacing or erecting new fencing where required, to remove grazing stock from the project areas; and
- revegetating areas with native vegetation where weed infestations are under effective management.

The project will be finalised in December 2007.

Conclusion

The success of the Braidwood Granites and Shoalhaven River Riparian Weed Management Projects can be attributed to the collaborative efforts of motivated land managers with on-ground support from SRCMA, combining funds from a range of government and non-government bodies. SRCMA tries to ensure a minimal level of red tape when building community partnerships.

Partnerships enable individuals, groups and agencies to tap into the motivation of individual landholders and facilitate wider involvement with on-ground support and incentive funding to achieve long-term environmental benefits.

Landholders will be able to continue to seek support and funding from Southern Rivers Catchment Management Authority to improve the condition of natural resources in the region.

Prolonged drought and the prospect of conditions intensifying with climate change present significant challenges for land managers on the NSW Southern Tablelands. The ability to manage land more sustainably, whether improving river health or revegetating rocky knobs, will be a key factor in the viability of this landscape for both livelihoods and natural resource values.

The Yarriambiack Vegetation Enhancement Project – changing lives and landscapes

Rae Talbot

Greening Australia, Minyip. Vic. Email: raetalb@netconnect.com.au

The Yarriambiack Vegetation Enhancement Project is a partnership between the Landcare network, Greening Australia and the Wimmera Catchment Management Authority and is managed by Greening Australia Victoria. The primary aim is to protect, restore and re-establish vegetation according to Ecological Vegetation Community (EVC) class, and to measure the outcomes in terms of habitat hectare gains. 'Habitat hectares' is a method used by the Victorian Department of Sustainability and Environment for assessing vegetation quality.

Recognised for its achievements at the State Landcare awards in September 2005, the Yarriambiack Vegetation Enhancement Project epitomizes what can be achieved when facilitation and project management are provided to people who are committed to improving our environment. Since inception in 1998, more than 200 landholders have taken part in this initiative that has resulted in almost 1100 hectares of land being managed for biodiversity conservation on the intensely farmed Wimmera plains. Over 1000 people have volunteered their time, in addition to the time commitment required of participating landholders.

There are now 420 hectares of new locally indigenous vegetation established, providing a net gain in the area and quality of native vegetation across the northern Wimmera, with measurable gains in its use as habitat by native fauna. Much of the vegetation is dominated by Buloke (*Allocasuarina luehmannii*), a threatened species listed under the *Victorian Flora and Fauna Guarantee Act*.

Yarrilinks – changing lives and landscapes

A special feature of the Yarriambiack Vegetation Enhancement Project is the commitment to changing lives as well as landscapes. Refugee families and other immigrants have become a key focus of an annual planting event called **Yarrilinks**. This event provides them with a real connection to their new home in Australia, establishing familiarity with the land and providing links with people who are making a living and a difference in their local area as they work side-by-side. Through the involvement of support groups such as AMES (Adult Multicultural Educational Services) and SAIL (Sudanese Australian Integrated Learning) immigrants from Melbourne, who are mainly Sudanese families, are able to participate in what has become a moving and rewarding experience for all involved.

The success of the project is due to the strong partnership approach and the support of philanthropic and corporate sectors and despite long years of drought, the results are clear – it is an outstanding success.

The cultural exchange has become an important part of the planting weekend and now the social and cultural outcomes are arguably as important as the environmental outcomes. Two bus loads full of people involved with AMES and SAIL now join the planting weekend each year. The numbers that attend are limited due to the capacity of the local community to host them. Volunteers are from over 17 different countries including China, France, Yugoslavia, Eritrea, Burma and Sudan in northern Africa. These people have limited English-speaking skills and are new immigrants to Australia but are mainly from farming backgrounds and therefore loved coming to the Wimmera, which is otherwise a culturally-isolated community.

Rae Talbot helping to serving our African dinner at Yarrilinks 2007. Photo: Adrian Tyler

Communities working side-by-side

The local community hosts all of the visitors into their homes and as a result many lasting friendships have been formed over the years. Considered matching of guests to host families is an important challenge to overcome. Details are limited to age, sex, nationality and what level of English they have. We try to match families with similar-age children or according to whether members of the host family have an interest in or have travelled to particular countries. The highlights are extra curricular activities, such as farm visits, which help emphasise a real sense of connection to land for these displaced people and create a common bond with the local community. Volunteers are invariably fascinated by machinery demonstrations and sheep and cattle farms which operate so differently to those

Buloke grassy woodlands being enhanced as part of Yarrilinks. Photo: Adrian Tyler

they are familiar with. Importantly there is also an element of information exchange.

A social event is incorporated into the Saturday night – something like bush dancing transcends language barriers and whilst it is a small experience of Australian bush culture, the whole group, locals and volunteers alike, really do have fun! Catering is also important, not only to nourish the workers, but also as a cultural and social event in itself. For example, well-known Melbourne restaurateur Shanaka has cooked up a storm for the last two years. Shanaka is the creator of the 'Lentil as Anything', restaurants where the patrons choose to pay what they consider is appropriate for the food and service provided. Incorporating social values, and using local produce as a key element of food supplied at the event, is an important way for cultures to unite over food. This year we had African food.

The impact on the people involved in this project cannot be overstated. Far more than just a planting weekend, this exposure to people and cultures far removed from the local norm whilst living and working together for the weekend deeply affects the local people.

Volunteers at Yarrilinks 2007 working on a ten hectare Broombush site planted as part of Greening Australia farm forestry program in the Wimmera. There is a biodiversity corridor planted around the perimeter that links back to the Yarriambiack Creek seen in the background. Photo: Adrian Tyler

The catch cry of 'think global, act local' is surely no better illustrated than this project where different nationalities have worked together side-by-side. The scale of the operation is also heartening to local farmers who are usually working solo in the field, tackling these problems alone. To see literally hundreds of hands in the earth helping them boosts morale and makes the seemingly impossible possible, particularly as the drought in the region continues.

Foundations for the future

The project has laid a great foundation for the future management and use of native vegetation in this intensively-farmed region, where farming output continues to underpin the local economy despite ten years of drought or below-average rainfall. It has also provided a great social interaction, at a time when a declining local population might have led to less contact and more isolation. Connecting the city with the country has never been more important than today.

Importantly, there are now a significant percentage of landowners with substantial knowledge of, and commitment to, the preservation of the natural values of their district. In the early days some landholders were hesitant to 'give up' any of their land. Now they realize the benefits not only to their property but to the region at large. They are well placed to play a role in the further protection and enhancement of native vegetation, particularly the region's threatened Buloke grassy woodlands. Not only can they continue to participate in this Landcare initiative, with its great social and cultural experiences, they can also look to participating in Habitat Tender and Bush Broker type programs, where they can be recompensed for the cost of providing the environmental services that they have become proficient in.

Volunteers provide impetus for weed program on Lord Howe Island

Ian Hutton

Lord Howe Island Nature Tours, Lord Howe Island. Email: ianhutton@clearmail.com.au

Volunteers around Australia and the world have, for a long time, provided a major force for dealing with environmental problems. Funding for land management agencies does not always provide enough paid workers on many projects. The enthusiasm and drive from individuals and small community groups who take up an environmental cause can have a big impact on the problem. However in a small community, the input of volunteers can have a much broader impact than just the volunteer hours provided, as demonstrated on Lord Howe Island through the efforts of the Friends of Lord Howe Island community group.

Lord Howe Island

Lord Howe Island is 550 km east of Port Macquarie on the New South Wales coast, and is administratively part of the State of NSW. The Island has a small human population of 300, and most residents work in tourism, seven days a week, often in several jobs. This can make it difficult to maintain an effective local volunteer program. Interest from visiting volunteers has made a major difference to the battle against weeds that were invading the Island's native forest. This effect has gone beyond the hours of volunteer labour provided. The activities and interest from mainland volunteers has changed the way that the community perceive weeds, and played a role in change of focus of the management agency of the Island, the Lord Howe Island Board.

The natural history of Lord Howe Island has long been recognised as unique and as early as 1870 the whole Island was declared a Botanical Reserve, and has always had some conservation status, culminating with World Heritage Listing in 1982. The Island has a rare and unique flora – having plants related to Australia, New Caledonia and New Zealand, with more than half of its native plant species found nowhere else in the world.

Weeds on Lord Howe Island

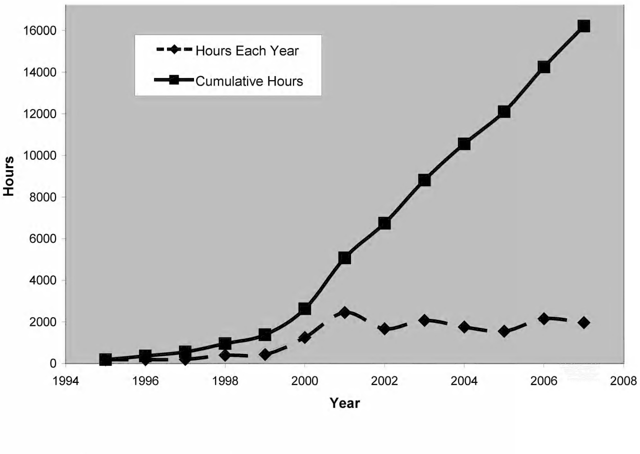
The Island has had a small settlement since 1834, and like most places that humans have settled, weeds eventually found their way into the environment. Many of the plants introduced to Lord Howe Island are a minor nuisance around the settlement area. However there are a number of introduced plants that have colonised areas away from the settlement and which pose a threat to the long term integrity of the native forest. In fact, the 1997 review of World Heritage values of Lord Howe Island identified weeds as the major threat to the conservation of the Island's unique flora and fauna.

Throughout the 1980's when attention to weed problems was coming to the fore on mainland Australia, the interest and capacity to do something on Lord Howe Island was not there. There were many places around the settlement where Climbing Asparagus was scrambling up and over the tree canopy 15 metres high, smothering the leaves and taking water and nutrients from the native forest species. The Ground Asparagus similarly grew vigorously and spread out to cover 95 percent of the ground, up to one metre high, in some areas of forest on the edge of the settlement. More serious problems away from the settlement with woody weeds such as Cherry Guava (*Psidium cattleianum*) did not get any consideration. Given time, these introduced species could modify the native forest to reduce species diversity and possibly cause extinction of some native plant species.

Because of the very limited resources on the Island the weed problem was not a priority of the Lord Howe Island Board. The sole Island ranger carried out some small weeding programs, but the many other duties meant weeding was only a token effort.

Weeding ecotours

I became concerned about the weed situation on the Island and from 1987 began including a half day weeding activity in week-long nature tours I was running. In 1995, with a number of bushcare people from Canberra, I was able to organise the first weeding ecotour, working on eradication of Ground Asparagus in the settlement and on Transit Hill. The program for the week was three hours in the mornings removing weeds, and the afternoons were spent exploring the Island, learning about its flora and fauna. This set the format for future weeding ecotours.



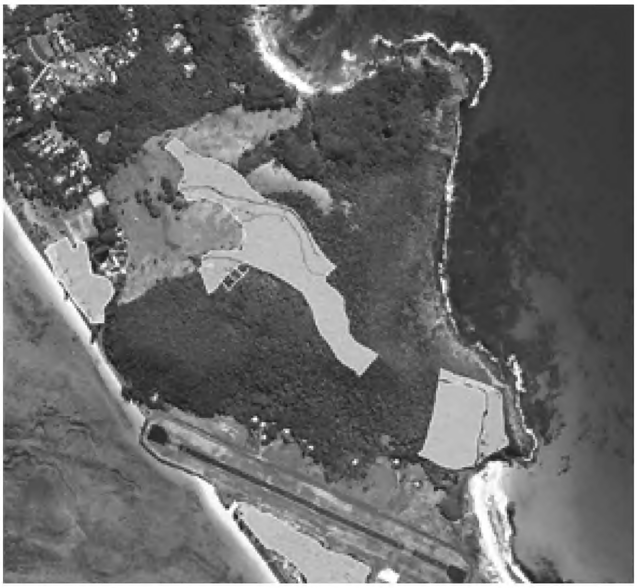
Weeding hours (each year and cumulative) put in by volunteers on ecotours to Lord Howe Island

Volunteers removing Climbing Asparagus from Transit Hill. Photo: Ian Hutton

In 1996 and 1997, with tour leaders Robert Coenraads and David Roots, we ran six successful environmental tours to the Island, and included a half day weeding activity with each group. To draw attention to the weed problem, we focused on high profile areas around the settlement adjacent to roads. Residents driving past would stop and look in amazement, and ask what we were doing. This started to create interest and debate in the community about the weed problem.

In 1998 another dedicated week-long weeding trip was organized with Sydney bush regenerator Rymill Abell and volunteers from the Lane Cove/Lindfield area of Sydney, and a second trip in 1999, followed by three trips in 2000.

The interest in the weeding ecotours was accelerated by two community grants from the Threatened Species Network, a program of the World Wide Fund for Nature (WWF) and the Endangered Species Program of the Natural Heritage Trust. The funding helped to purchase equipment and materials as well as helping with the volunteers' accommodation and travel costs. This incentive provided the catalyst for greater volunteer interest.



Map showing the area on Transit Hill treated for Asparagus infestation from 1995 to 2007. Photo: Photo: Ian Hutton

Over the twelve years the program has been running, the ecotours have become very professional. Assistant tour leaders are drawn from a variety of backgrounds - Dr Bill McDonald from Queensland Herbarium, Dr Elizabeth Brown, Botanist with Sydney Botanic Gardens, professional bush regeneration coordinator Danny Hirschfield, and a number of coordinators from volunteer groups in Sydney. The diverse backgrounds of these leaders brings a wide range of talents to the program that has resulted in one of the most successful and effective volunteer ecotour experiences in Australia. A number of trips have been run in conjunction with Friends of the Sydney Botanic Gardens and The Australian Museum Society.

Friends of Lord Howe Island

In October 2000 the Friends of Lord Howe Island group was formally established to strengthen the weeding program, raise funds for conservation projects on the Island, and increase awareness of the conservation issues there, through a quarterly newsletter and publicity about environmental projects on the Island.

Each year now from June to September there are six ecotours where around 22 'volunteers' pay to come to Lord Howe Island and work on eradication of weeds. The tour program includes mornings weeding, afternoons on walks and boat trips, and evening lectures on Lord Howe Island's flora and fauna. The groups stay at Pinetrees Resort which is a guesthouse established in 1900, and noted for its fine hospitality. In order to motivate and encourage residents to weed their leases, volunteers from the Friends of Lord Howe Island assist land holders each year with weed removal from leases, further increasing awareness of weeds in the community.

The influence has not stopped with providing volunteer labour for dealing with weeds. With this high level of interest shown from 'mainland' volunteers there has been a big increase in awareness and effort to deal with weeds on an Island-wide scale. The influence of the volunteers' interest has changed focus on the management of the Island.

Wherever possible the Friends of Lord Howe Island assist the LHI Board with other conservation programs. For example assisting with removal of Bridal Creeper from the Middle Beach area, and planting native trees in reforestation areas. The FLHI took the lead in commencing eradication of Madeira Vine *Anredera cordifolia* on leases.

The volunteer hours provided by FLHI groups go towards in kind contribution when the LHI Board is applying for grants. In 2002 the Friends of Lord Howe Island received a community grant from WWF that was used to fence off an area of pasture containing a remnant of the endangered *Lagunaria patersonia* swamp community, and replant with native trees. This area has now been expanded, and a second *Lagunaria* replanting project has been established on the Island. In 2003 the Friends of LHI received a community grant from the Norman Wettenhall Foundation for eradication of a bamboo infestation on the Island.

Left: Friends of Lord Howe Island volunteers undertaking a restoration project for the endangered Calystegia affinis*.*
Right: Participants in weeding ecotours enjoy afternoon walks to discover and learn about the Island's flora and fauna.
Photos: Ian Hutton

Lord Howe Island strategic weed plan

In 2002 the Lord Howe Island Board prepared a strategic weed plan for the Island. The Friends of Lord Howe Island weeding ecotour program was formally integrated into this strategic plan. Also in 2002 the LHI Board began weed mapping on the island, to provide a baseline for weed densities and provide a plan for effective work schedules. Major funding has been sourced to employ local workers full time removing weeds across the Island. In 2004 the LHI Board received a grant of $1.2 million from the Environmental Trust's Integrated Environmental Program for removal of Bitou Bush and Cherry Guava, over three years. Between November 2004 and December 2006 the LHI Board teams had removed over 1 million weeds – mainly woody weeds such as Cherry Guava, Ochna, *Pittosporum undulatum* and Cotoneaster. In 2007 a Flora Management Officer was appointed for two year term to continue coordination of the weeding effort. It is hoped in this time to have local teams and volunteers cover the entire Island at least once to remove all fruiting weeds, so that future years can be monitoring for seedling growth.

What makes successful weeding ecotours?

Since 1995 there have been 47 ecotours, with 15,600 volunteer hours provided. In 2006, 64 percent of participants had been at least once before; many have been five times and one has even been on ten trips. People come from all states of Australia, as well as New Zealand and several other countries. People come from all walks of life – farmers, doctors, politicians, teachers, housewives, retirees, engineers.

Through communicating with ecotour participants we have been able to find out just what it is that makes these trips so successful. Certainly the beautiful environment of Lord Howe Island is something that appeals to many people to visit, but for people to pay around $2000 for this type of trip it needs more. It is the combination of strong leadership, high quality natural history interpretation, contributing to preserving the environment, good company with people of similar outlook, close cooperation with the land management agency and a high standard of hospitality. It appears to be successful only because all of these ingredients are present. The ecotours are now integrated into the overall LHI Board weed strategy and will continue to provide assistance to the task of weed eradication on the Island.

TARGET WEEDS ON LORD HOWE ISLAND

The main weeds the volunteers deal with are two species of 'asparagus fern' – Climbing Asparagus (*Asparagus plumosus*) and Ground Asparagus (As*paragus aethiopicus*). These two species were both brought from South Africa as ornamental plants into Australia, where they are also considered a major weed in many coastal areas. They were taken to Lord Howe Island some time in the 1930s. They both have water storage tubers and so the climate and the sandy soil of the lowlands suits them, and allows them to flourish and invade the native forest. Several bird species disperse the seeds into the native forest, but the worst infestations have been adjacent to the settlement area.

Treatment of weeds by the volunteers is hand removal wherever possible. However, for Climbing Asparagus, cutting the stem close to the ground and applying concentrated glyphosate herbicide from a dropper bottle is the technique used. Trial plots to monitor effectiveness of different treatments have confirmed the success of this treatment. Follow-up over the treated area is an important part of the program to ensure all plants have been removed. It is twelve years since the program started and the first areas treated are showing good regrowth of native plants.

Further Information

Lord Howe Island Nature Tours. PO Box 157, Lord Howe Island, NSW 2898 Australia. Email: ianhutton@clearmail.com.au

Lord Howe Island Tourism Association website. http://www.lordhoweisland.info/

Wildcare Threatened Plant Action Group: raising the profile of Tasmania's threatened plants

Catriona Scott

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The Threatened Plant Action Group (TPAG) is a newly formed activity of Wildcare, an incorporated environmental action group in Tasmania with more than 3000 members that undertakes volunteer work supporting natural and cultural heritage conservation throughout the State. The TPAG hosted its first events in September, celebrating National Threatened Species Day with talks and a display, followed up with working bees in two threatened ecological communities. The first working bee, held at Apsley River on Tasmania's east coast, focused efforts on removing gorse from a stand of *Eucalyptus ovata – Callitris oblonga* forest. As well as working hard, volunteers enjoyed beautiful weather for the day, and encountered numerous species coming into flower. The following weekend saw TPAG volunteers removing Gorse, Briar Rose and Blackberry from a lowland Themeda grassland site, home to ten state listed threatened species, including *Cryptandra amara* and *Hibbertia basaltica* (see case study in box).

The TPAG has been established to encourage and facilitate state-wide community involvement in threatened flora protection and recovery. More than 70% of species listed as threatened in Tasmania are plants. Tasmania's threatened flora includes a diverse array of beautiful, rare and unique species, from grasses, ferns and orchids, through to large trees such as the Miena Cider Gum (*Eucalyptus gunnii* ssp. *divaricata)*. Many of our threatened plants are endemic to Tasmania, being found nowhere else in the world.

Many things can cause a species to become threatened, including past land use, habitat degradation, grazing by both native and introduced animals, weed invasion, loss of pollinators, altered hydrology, *Phytophthora*, drought stress and altered fire regimes. Once threatened, species require appropriate management to ensure they can survive in the wild and do not go the way of the Thylacine. With over 400 state-listed threatened plant species in Tasmania and only limited resources to look after them, volunteer contributions are vital to the successful implementation of threatened flora recovery actions.

TPAG volunteers will work closely with Threatened Species Section staff of the Department of Primary Industries and Water (DPIW) on current flora recovery programs, ensuring their efforts will be relevant, timely and worthwhile. Volunteers may get involved in a wide range of threatened flora related activities including: surveying and monitoring of threatened populations, especially orchid populations (see box); weed eradication at key sites; fencing populations to protect them from over-grazing; research into threatened species ecology, seed germination, pollination and response to fire; conservation plantings; raising seedlings; organising awareness raising events; website development; community education activities; writing and updating threatened flora listing statements; data entry … and so on!

By joining the TPAG you can contribute to the conservation of Tasmania's precious and unique threatened flora. You might just help bring a species 'back from the brink'!

Introducing the new TPAG coordinator, Catriona Scott

With the help of a Threatened Species Network Community Grant from WWF, I was recently appointed to help get the Threatened Plant Action Group underway. Born and raised in Darwin, I moved to Tasmania in 2002, where I fell in love with the island's communities and natural environment. My passionate interest in native vegetation conservation, and urban sustainability issues led me to undertake a Bachelor of Natural Environment and Wilderness Studies at the University of Tasmania, which I completed in 2006.

Over the past ten years I have worked with numerous and diverse volunteer organisations, from the Sunshine Coast Environment Centre, to the Hobart Organic Food Cooperative, initially in a volunteer capacity, and later as a volunteer coordinator. My experiences with community groups working on environmental protection and sustainability issues have been inspiring, challenging and rewarding and I now see volunteering as an essential force in conservation and environmental protection.

As coordinator of the Threatened Plant Action Group, I look forward to helping create a vibrant and dynamic community group, engaging in hands-on threatened flora recovery projects, exploring beautiful places, working with diverse communities and raising the profile of Tasmania's threatened flora.

For more information on Tasmania's threatened flora: http://www.dpiw.tas.gov.au/threatenedspecieslists

For more information on the Wildcare Threatened Plant Action Group, contact the Coordinator Catriona Scott on 03-6233 6692; catriona.scott@dpiw.tas.gov.au.

Case study – Basalt Guinea Flower *Hibbertia basaltica*

The Basalt Guinea Flower is a small prostrate shrub producing branches up to 40 cm long and prominent yellow flowers. This species was only identified for the first time in 1999 on private land at Pontville (now the Pontville Crown land block) and formally described and named in 2005. The common name refers to the species' preferred basalt substrate. The species is currently listed as rare on the *Tasmanian Threatened Species Protection Act 1995*, but nominations have been made for listing it as endangered at both state and national levels.

Considerable areas of Basalt Guinea Flower habitat in the Pontville–Bridgewater area have been cleared over the past 200 years for agriculture and urban development. Only small remnants of native grassland on basalt remain, typically on land considered too rocky for development.

The largest of the seven known Basalt Guinea Flower patches is within the Pontville Crown land block, and while secure from land clearance it is threatened by woody weed invasion. Recently the Threatened Plant Action Group hosted two working bees, with volunteers cutting and painting Gorse, Briar Rose and Blackberry on site. The other six patches of Basalt Guinea Flower occur on nearby private property and are under threat from land clearance, weed invasion and overgrazing by sheep and cattle.

Hibbertia basaltica *(Basalt Guinea Flower). Photo: Richard Schahinger*

Taking care of Tasmania's threatened orchids

Of Tasmania's 195 native orchids, 68 species are listed as threatened at the state level, with 32 listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Almost half of all state-listed orchid species are endemic to Tasmania. Many species are known from only a few sites, or are known from only very small populations, making them highly susceptible to localised environmental fluctuations, altered fire regimes and soil disturbance.

Our knowledge of threatened orchid populations is limited, due to a lack of formal monitoring of orchid populations to date. Until recently, observations and records of orchid populations and species' distributions have largely been provided by orchid enthusiasts. Earlier this year a Threatened Orchid Project Officer was appointed by Department of Primary Industries and Water (DPIW) to provide baseline data surveys on Tasmania's threatened orchids. We are seeking some dedicated volunteers to assist Threatened Orchid Project Officer, Matt Larcombe, with field surveying and monitoring of threatened orchid populations throughout the state, over the summer field season. Matt can only take one or two volunteers out at a time, and preferably volunteers with a strong interest in orchids, and a keen eye! Volunteers will be assisting with threatened orchid surveying and monitoring of known threatened orchid populations.

Caladenia tonellii *(Robust Fingers). Photo: Peter Tonelli*

Community working to save the threatened plants of Wongan-Ballidu

Sonya Thomas

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The shire of Wongan-Ballidu, in the Western Australian wheatbelt, is a centre of plant diversity and endemism. There are around 22 taxa of Declared Rare Flora (flora listed as threatened species) endemic to the shire, with distributions centred around the towns of Wongan Hills and Ballidu. There are even more species that are poorly known, poorly collected and/or thought to be threatened.

Given the astounding floral diversity of the area, and the high level of threat to this diversity, the community formed the Wongan Ballidu Bush Care group in 2003. The group began by constructing walk trails to educate locals about their unique flora and vegetation, and has moved on to providing casual staff for the Department of Environment and Conservation (DEC) for conservation activities and setting up a regional herbarium. Although a very small group, with 10-15 members, we are very dedicated to the work and knowledge that we bring to the shire. Our motto and aim is:

> *To preserve and restore the natural assets of the Wongan Ballidu region through education and active management.*

Educational activities

One way of achieving our aim is through the establishment of a regional herbarium. Several members of the group are licensed to collect herbarium specimens, which we are continuously doing. The number of specimens is growing rapidly and, once mounted and filed, they will be kept at the Wongan Hills Visitor Centre for anyone to look at.

Group member, Lyn Phillips, surrounded by the Declared Rare Flora species Microcorys eremophiloides *in Wongan Hills. Photo: Sonya Thomas*

Another way of educating the public, and building the value of our flora in the eyes of the local community, was to produce a Rare Flora Birthday Calendar. In 2003 we were successful in a grant to do this, and we engaged the Year 8 students from the Wongan Hills District High School to design some emblems for the calendar. The calendar was distributed free to the community and was very popular. In 2007 we reproduced the calendar, with support from Wongan Trees and DEC, and these are for sale at the local Visitor Centre.

A further educational activity we have undertaken was working with DEC to produce a book of 'Threatened, poorly known and other flora of Wongan-Ballidu.' As well as showing the variety of rare and threatened plants of the area, the book also contains information on some more common plants, which we hope makes the book more useful and enjoyable for everyone. DEC has donated numerous copies of the book to our group, which are selling very well from the Visitor Centre.

In addition to written material, we have also developed a lovely Rare Flora Garden in Wongan Hills (near the Visitor Centre), which we maintain along with help from the Wongan-Ballidu Shire. The garden allows locals and tourists to see the threatened flora of the shire in person. We are looking at extending the garden in the near future ready for new plants in 2008.

Conservation activities

In 2005 we planted trees and shrubs on both ends of a local reserve, Reynoldson Reserve. Some of the trees have grown very well, considering the weeds and vermin in the area.

2007 has been a busy year for the group, with a few members working for DEC's Avon Catchment Council-funded 'Back from the Edge' project. As part of this project we have been surveying, monitoring and building fences around our area for Declared Rare Flora. We counted many *Microcorys eremophiloides* (Wongan Microcorys) during the summer months and found an excellent population of *Stylidium coroniforme* subsp. *coroniforme* (Wongan Hills Triggerplant) which, when we were last out in

Sonya Thomas and Lyn Phillips next to a newly discovered population of the critically endangered Acacia pharangites *at Wongan Hills. Photo: Joel Collins*

the area, was flowering beautifully. We have found that, in the course of our involvement with the group, we have had to quickly familiarise ourselves with the local rare plants. This means we have found plants that we otherwise would not have realised were rare. For example, we found a new population of *Acacia cochlocarpa* subsp. *velutinosa* (Velvety Spiral Pod Wattle) and have found more plants of *Acacia pharangites* (Wongan Gully Wattle) and re-counted the known populations in the hills.

We are now trying to count as many of the rare plants as we can while they are flowering, as some of them are extremely hard to detect when they are not flowering, especially for learners. Another reason for haste is that, with this year's low rainfall, many of the species will have shortened flowering periods. We have also noted that in some areas where there are known populations of rare plants they have not been found this year, which may possibly be due to the dryer conditions. Our knowledge while we are out and about has increased and we are becoming more and more familiar with our native bush, flora, fauna and surroundings.

In addition to flora conservation, we have also been involved in some fauna conservation activities. This year we surveyed a small part of the local Rogers Reserve looking for the elusive Malleefowl. We were fortunate on our second survey to see one Malleefowl, but have yet to find an active mound. We hope to continue our Malleefowl surveys in the area and, of course, would love to find an active mound.

The future

An Avon Catchment Council project called 'Ecoscapes' (run by Greening Australia and DEC) is planned to incorporate Wongan Hills and surrounding areas. This project will look at managing and conserving remnant vegetation, developing new revegetation projects and improving links in the landscape to promote the conservation of our biodiversity.

Another project our group is interested in is restoring a local lake, Lake Ninan, to how it used to be in the 1960s. We are particularly interested in addressing salinity and other issues to bring back the aesthetic, recreational and conservation values of the lake, which is very important to the local community. We have liaised with groups involved in this area and, although we are still in the early stages, we expect it to be a 3-5 year project with grant money and help from the local shire.

We look forward to continuing to work with the rest of the community and a host of other organisations to conserve and manage our native flora, fauna and other natural assets.

The Wongan-Ballidu Bushcare Group in 2005 during a rare flora survey for Grevillea dryandroides *subsp.* dryandroides*. The Group assisted DEC that day to extend known populations and total plant numbers. Photo: Joel Collins*

Protecting swamp communities in the Blue Mountains

Anne Carey

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An integrated program of works is underway in the Blue Mountains to protect and enhance the condition and extent of upland sedge and shrub swamp vegetation. This vegetation falls within ecological communities listed as endangered under both commonwealth and state legislation. Temperate Highland Peat Swamps on Sandstone is listed as an Endangered Ecological Community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Montane Peatlands and Swamps is listed as an Endangered Ecological Community under the NSW *Threatened Species Conservation Act 1995*. The nominations of these ecological communities as threatened at both federal and state level were originally initiated by The Blue Mountains Conservation Society (BMCS), a community-based NGO. In support of these listings Blue Mountains City Council (BMCC) was successful in obtaining external funding from the NSW Environment Trust and the Hawkesbury-Nepean Catchment Management Authority to undertake extensive works, in partnership with the community, to rehabilitate degraded swamp systems.

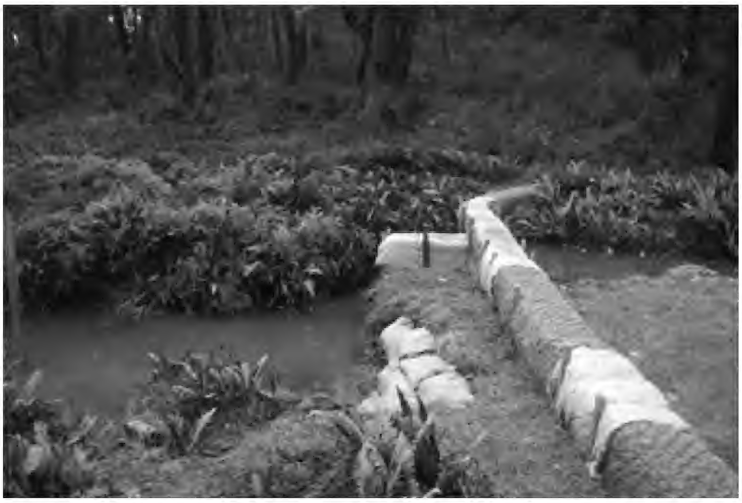
Context of the project

Upland swamps are a floristically diverse community (see box) providing invaluable ecosystem services through maintenance of baseflows (normal dry-weather flows) to downstream reaches, moderating peak flow events and filtration of pollutants. In addition, these swamps provide critical habitat for several threatened species and many regionally significant plants including, but not restricted to, *Carex klaphakei* (listed as Endangered under NSW threatened species legislation), *Lepidosperma evansianum* (Vulnerable), *Almalaea incurvata* (rare), *Acacia phytoclada* (endemic between Woodford and Mt Victoria), *Banksia ericifolia* (endemic from Moss vale to Northern Blue Mountains) and *Grevillea acanthifolia* (endemic to Central tablelands above 450 m).

Approximately 900 ha of sedge and shrub swamps occur in the Blue Mountains Local Government Area on a variety of land tenures. Many occurences are within the heavily urbanised ridgeline and extend downslope into the reserve system. The changes to swamp hydrology, the increase in impervious surfaces (such as roads) and the delivery of stormwater from the urban areas are the key processes that threaten the systems, for a variety of reasons. These include:

- reduction of recharge to aquifers that support groundwater dependant ecosystems;
- reduction of sub-surface flows and increase in overland flow;
- erosion, gullying and formation of channels within swamps;
- delivery of sediment into swamps, and
- delivery of weed seed and propagules into swamps.

In degraded swamps there has been a significant change to the original floristic complexity of the community due to dessication of organic substrates. This is caused



Left: Check dams constructed from coir logs to retain water within the swamp. Right: Endemic upland swamp species Almalaea incurvata. *Photos: Anne Carey* by the redirection of subsurface flows into incised channels and through pipes (also formed by erosion) between the peat layer and underlying substrate.

Incised channel within a swamp causing desiccation of peat substrates and ensuing vegetation die back. Photo: Anne Carey

Methods and Outcomes

The project utilised soft-engineering techniques, using materials such as coir logs, sterilised straw/hay bales and jute matting to pack and infill areas of channelling and piping in swamps. Over time, these organic materials break down and become part of the swamp substrate. The principal theory is to slow the movement of water through the system by constructing check dams, chains of ponds and packing of channels to create enough pressure to force water laterally through the swamp substrates. This is preferably complemented by spreading and holding water below stormwater outlets to allow infiltration of water into the soil and improve subsurface flows and reduce overland flows before water enters the swamp system.

Initial implementation of the project involved teaching staff and volunteers about these soft-engineering techniques. The project was able to draw upon the large volunteer base provided by the extensive Bushcare network. This network has been engaging community members in conservation works for 15 years. Staff involved in NSW NPWS fens and bogs restoration programs in the Australian Alps were engaged to present workshops and to provide technical advice to Council staff, volunteers and contractors.

Implementation at some sites has required major remediation involving both hard engineering at the end of stormwater pipes in combination with soft engineering within the swamp. Large swamp sites with multiple problems have been remediated using a combination of contractors, BMCC staff and volunteers. Small works in and above swamps suffering only the initial stages of degradation have been solely implemented by volunteers under the direction of BMCC officers.

The proposed outcomes of the project include:

- undertaking key threat abatement activities at identified priority sites (containing threatened species) showing signs of degradation;
- treating weeds on up to 10 ha of swamp vegetation;
- trialling a range of innovative techniques to stabilise gully erosion and piping along watercourses feeding into swamp communities;
- planting 15,000 plants endemic to swamp communities;
- mitigating recreation-related impacts on swamps by way of track rehabilitation and fencing;
- raising public awareness of the importance of upland swamps and associated threatened species;
- developing a sediment and weed source control program for residents adjacent to swamp communities;
- working with private landholders in priority sub-catchments to protect and enhance swamp communities on private property; and
- conducting workshops for agency staff and community groups.

Key Achievements

A dedicated website (www.swampcare.com.au) has been created to keep the community and volunteers up to date with onground works, upcoming events, threatened species information and general information pertaining to swamp communities.

A ‘Swampcare’ network has been developed under the existing Bushcare banner and volunteers from across the Blue Mountains spend a day working at a particular swamp. This may involve targeting a specific weed species or installing soft engineering structures in drainage lines. Sixty volunteers belong to this network and have contributed over 1000 volunteer hours in the first six months of the project.

Tracks have been closed, walking trails consolidated and interpretive signage installed at recreational sites where usage had damaged sensitive swamp vegetation.

There has been a reduction in the area affected by terrestrial weeds through a combination of works undertaken by volunteers, contractors and council staff. Substantial weed plumes have been treated below stormwater outlets and weeding has targeted swamp-invading species such as Tutsan, Himalayan Honeysuckle, Broom, Erica and Blackberry. Council’s noxious weed team surveys

Volunteers removing Tutsan and Himalayan Honeysuckle. Photo: Michael Hensen

terrestrial weeds on or near swamp systems with a view to integrating noxious weed control into the project.

Community nurseries have been engaged to collect seed and propagate plants for use in the rehabilitation of upland swamps. Some 15,000 local provenance stock will be grown over the next three years (see box). The benefit of this is twofold: the skills gained by propagating sedge species (which are not commonly available from commercial nurseries) will allow the nurseries to have these plants available for public sale, and these skills will be held within a community based organisation.

Substantial soft engineering works have been undertaken at several sites. This has involved the construction of major check dams, extensive channel-packing, water spreading and construction of chains of ponds. The benefits of these works have been immediate with water held within the swamp systems, moderation of flows, and lateral rehydration of swamp substrates.

Further Reading

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Blue Mountains swamps typically contain a combination of the following species. Other species also occur.

*Acacia rubida**
Acacia terminalis
Almalaea incurvata
Baeckea linifolia
Banksia ericifolia subsp. *ericifolia**
Banksia spinulosa var. *spinulosa*
*Callicoma serratifolia**
*Callistemon citrinus**
Dampiera stricta
Drosera binata
Empodisma minus
Entolasia stricta
Epacris obtusifolia
Epacris pulchella
Gahnia sieberiana
Gleichenia dicarpa
Gleichenia microphylla
Gonocarpus teucrioides
Goodenia bellidifolia
Grevillea acanthifolia subsp. *acanthifolia*
*Gymnoschoenus sphaerocephalus**
*Hakea teretifolia**
Hibbertia riparia
*Isopogon anemonifolius**
Juncus spp.*
Lepidosperma limicola
Leptocarpus tenax
*Leptospermum grandifolium**
*Leptospermum juniperinum**
*Leptospermum polygalifolium**
Lepyrodia scariosa
Lomandra longifolia
Mirbelia rubiifolia
*Patersonia sericea**
*Petrophile pulchella**
Ptilothrix deusta
Pultenaea divaricata
Sprengelia incarnata
Symphionema montanum
Tetrarrhena turfosa
Xyris ustulata

*currently being propagated for use in this project.

(Adapted from http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Blue_Mountains_Swamps_vulnerable_ecological_community)

Revegetation of the Boboyan Pine Plantation, Gudgenby Valley ACT

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Introduction and Background

The Gudgenby Bush Regeneration Group (GRBG) was formed in May 1998 to involve the community in a Park Care Group with the job of rehabilitating 380 ha of land that supported a pine plantation in the southern part of Namadgi National Park, ACT. The Group meets every month to do weeding, tree planting or seed broadcasting. Current membership stands at around 22 and we have between eight and twelve active members who attend most work parties.

The Boboyan Pine Plantation, consisting of *Pinus radiata*, was established at the southern end of the Gudgenby Valley in 1966 in an area which had previously been cleared and used for grazing. In 1979 the plantation was included in the Gudgenby Nature Reserve and in 1984 it was included in Namadgi National Park. This Park is significant for its unique landscapes and cultural values and because of the relative closeness of wilderness areas. The 1986 Plan of Management for the Park recommended the removal of the pines and replacement with suitable native trees and shrubs.

After extensive lobbying from the National Parks Association of the ACT Inc. (NPA ACT) the ACT government made a commitment in 1995 to harvest or remove the plantation and rehabilitate the site. The removal of the first pines began in 1997. The plantation was divided into compartments. Some areas contained harvestable timber while others were considered non-commercial and were clear-felled. The pine slash in these areas was left on the ground and later burnt to provide an ash bed into which seed could be broadcast. A quantity of local seed of appropriate species, estimated to be enough to complete the project, was collected by contractors, on behalf of the ACT Parks and Conservation Service.

Gudgenby Bushies Workparty.
Photo: Gudgenby Bush Regeneration Group

In the winter of 1998 GRBG initiated the first of many work parties by seeding the first cleared areas with local seed consisting of Silver Wattle (*Acacia dealbata*), Red-stemmed Wattle (*A. rubida*), Blackwood (*A. melanoxylon*), Candlebark Gum (*Eucalyptus rubida*), Peppermint (*E. dives*) and Snow Gum (*E. pauciflora*). Black Sally (*E. stellulata*) was planted along creek lines. By 2005 all the pines had been removed and the whole area seeded or planted to local native species. The area is now known as the Gudgenby Bush Regeneration Area.

Monitoring program

In addition to the rehabilitation work, a monitoring program was established to record growth rates and to determine what methods of plant propagation worked best so that techniques could be modified to suit appropriate local conditions. An NHT grant in 2000 enabled GRBG to set up eleven 400 m^2 netted exclosures in the Hospital Creek compartment so that grazing and browsing by macropods and rabbits could be monitored, as well as providing a seed source for that section. Ten of these exclosures were planted out with seedlings in the year 2000. One was left unplanted as the control. Leaf litter from nearby woodland was placed in six exclosures to see if this created a greater diversity by introducing propagules.

In October 2006 a group of students from NSW TAFE (Goulburn campus) supervised by two teachers conducted a survey of four exclosures within the Hospital Creek compartment. All vegetation species present in the exclosures were recorded. A quadrat outside each exclosure of the same size (20 m x 20 m) was pegged out and similarly surveyed. This ‘outside exclosure’ quadrat was chosen randomly to provide a comparative analysis with respect to grazing pressures. An estimate was also made, for each quadrat, of the percentage cover of bare soil, surface litter, rock and weed.

Grazing of rabbits and kangaroos was evident outside the exclosures from both animal scats and the reduced height of grasses and herbaceous plants. However the difference between numbers of species in and out of the exclosures was only minimal. The only exception was one exclosure which had been treated with leaf litter which had a higher value for the ratio of native species to weeds. There was also little difference in the number of tree and shrub species in and outside the exclosures, and in some cases the trees outside the exclosures were greater in number and health than inside. Snow Gum was the most common tree followed by Candlebark Gum. Grazing outside the exclosures puts greatest pressure on the herbaceous species.

From the eight quadrats surveyed there were nine species of the 94 identified in the survey that were only found **within** exclosures. These were: Billy Buttons (*Craspedia variabilis*), Matted Bossiaea (*Bossiaea buxifolia*), Common Stock's Bill (*Erodium crinitum*), Spiny-headed Matrush (*Lomandra longifolia*), Hairy Panic (*Panicum effusum*), Rock Tussock (*Poa saxicola*), Poa Tussock (*Poa sieberiana*), Kangaroo Grass (*Themeda australis*) and Bedstraw (*Galium ciliare*). We can assume that the exclosures are protecting the above species from grazing mammals.

Other data to monitor germination and growth have also been collected from eight transects set up in various locations as the compartments were seeded. Transect records indicate that while growth is slow and frequently patchy, many trees are being established. Overall, the eucalypts have germinated much better than the acacias.

Evaluation

Nine years on and all the pines have been felled except for the occasional one that has eluded the keen eyes of the GBRG group members. What have we learned and achieved?

- seeding soon after the burning of the pine trash produced the best germination results;
- light surface cultivation of the soil is generally sufficient to allow germination to take place;
- seeding near burnt pine logs offers protection for young seedlings;
- planting seedlings in rip lines does not necessarily provide for good cover of plants once germinated, because if some die there are obvious gaps in the landscape. While this method has worked in some parts of the regeneration site, in other parts many seedlings died due to lack of water;
- planting seedlings randomly has provided an improved success rate because it allows choice of planting position according to factors such as how stony the soil is and possible protection. In addition, even if some plants die, the gaps are not so obvious;
- grazing and browsing by Kangaroos, Wallabies and Rabbits is a major problem. Young seedlings frequently show signs of grazing and physical damage; and
- spraying and weeding of Blackberries, in particular, is a vital part of the program as they have the potential to out-compete young eucalypts and acacias.

A project of this size has not been attempted before in the ACT and without the enormous amount of work that went on behind the scenes with support from NPA volunteers and park staff, this project would never have succeeded. Congratulations should be given to the regular members whose tireless efforts have made a very great difference to the landscape.

Shoalhaven Volunteer Community Nursery

Kerry Thompson

Shoalhaven Volunteer Community Nursery, Culburra Beach, NSW. Email: thompson@shoalhaven.nsw.gov.au

The Shoalhaven City Council Bushcare movement is a dynamic and energetic collection of people who dedicate many volunteer hours to the conservation of natural areas throughout the Shoalhaven region in south-eastern New South Wales.

The revegetation of degraded sites in natural areas is an integral component of the bush regeneration works carried out by volunteers. Endemic plant stocks were always sourced from local nurseries where possible, but community members were aware that provenance stock is preferred – not only plant species that occur at the area, but plants propagated from locally collected seed or plant material and planted back on site.

It was this knowledge of and desire to implement best practice management techniques that encouraged Shoalhaven Bushcare members to form a new Bushcare group that focused on native plant propagation.

Setting up the nursery

The Shoalhaven Volunteer Community Nursery started with a disused shadehouse that had been erected by a once active Dunecare group at Culburra Beach. The structure is located in a Council-owned compound housing a large shed at Crookhaven Headland and boasts some of the finest coastal scenery in the district, having 270° water views of the coast and surrounding ranges. The Culburra Beach Progress Association restored the facility to working order

Top: Nursery volunteers (left to right) Bob Martin, Brian Harris and Les Parry preparing plant propagation material.
Bottom: Shadehouse filled to near capacity.
Photos: Kerry Thompson

and in 2003 the Shoalhaven City Council agreed to fund the operation and allocate a part-time project coordinator.

Plant propagation workshops commenced and a small band of volunteers began to learn the art and skills of growing native plants. The project has attracted a number of horticulturists to the group who offer a wealth of knowledge as members swap and share information. The informal atmosphere and learning style accommodates people from all walks of life, from the young to the young at heart. Some group members follow the propagation process from beginning to end, collecting local seed, propagating the plants and utilising the stock for revegetation works at their specific Bushcare site. Other members prefer just to grow the plants for other Bushcare groups to utilise.

Expanding the plant stock

Plant stock species are gradually diversifying with the ever-increasing knowledge gained by the group. The sometimes complex requirements for growing native plants pose great challenges to the group, with trials being implemented to achieve maximum propagation success. When a specific species is requested for propagation, the literature can be scarce or non-existent, so trials are conducted and success can result. This information is being documented and being made available at the nursery so that others will learn from the experiences of the group.

Involving the community

The nursery facility is available to other community groups on request, and the coordinator is more than happy to guide workshops on plant propagation to empower community members to grow local native species. The local Jerrinja aboriginal group is participating in the propagation workshops to learn native plant propagation with the aim of expanding their own bush regeneration skills and activities. The local scout group participates when scouts want to gain their environmental badges. School students join in, in their bid to gain the Duke of Edinburgh Award, and visitors to the area drop by on workshop days to see what the hive of activity is all about on a Sunday morning.

One aim of the nursery is to encourage residents to grow native plants in their gardens. To this end the nursery provides plants to give away at community events. These plants are always well received and the accompanying education on weedy species hopefully is changing many people's attitudes to what constitutes a preferred garden specimen.

The nursery also provides plants to residents who have been ordered to remove noxious weeds from their gardens, or to some residents whose gardens are spreading environmental weeds in a sensitive area, in the hope of fostering a more responsible gardening ethic.

Operating the nursery

The Shoalhaven Volunteer Community Nursery group meets on the last Sunday in the month for three hours in the morning. Considering this minimal commitment, over 12,000 provenance tubestock have been distributed to Shoalhaven Bushcare groups since operations began. Over 30 species are propagated, with this number increasing due to the diversity of Bushcare groups joining in the nursery activities. Initially, plants were grown to target coast restoration works, but now plants are propagated to include rainforest, heathland and saltmarsh projects. A total of 21 different Bushcare groups have been supplied with plant stock. Since the beginning of the project 11 Bushcare groups have been represented at the nursery and ten community groups have been involved, including two schools.

The nursery has an annual running budget of $1000 plus the coordinator's wage. All costs are incurred by the Shoalhaven City Council Bushcare program. Plants are free of charge to all community groups and the project aims to keep the distribution of plants free of charge. The group does not wish to commercialise the nursery and compete with industry nurseries. The project cannot at present fulfill the plant stock requirements of all the 70 Bushcare groups throughout the Shoalhaven, so commercial stock is still purchased. The nursery project is fulfilling the niche of supplying stock that is prioritised to be provenanced.

Sensitive ecological sites receive the stock if seed or plant material is made available for propagation.

This year the group was successful in gaining a grant from the NSW Environmental Trust. The monies will go to the erection of another propagation house, a water tank and automatic watering system and water sensor device running from the tank. The additional space will allow for increased propagation of stock, but members are aware that the quality of stock is paramount, as opposed to quantity of stock.

A vision turned into reality

The Shoalhaven Bushcare community saw a vision and set out to turn that vision into reality. Now they are able to access provenance plant stock for revegetation works in sensitive ecological communities throughout the Shoalhaven region. In addition, they have also created a meeting place where members of the community enjoy each other's company, learn new skills and knowledge, contribute to the preservation of a diverse environment and enjoy the mighty fine view on a Sunday morn!

Top: Sunshine Street Bushcare members planting out nursery stock at their Culburra Beach site. Bottom: Group members sharing knowledge, skills and company. Photos: Kerry Thompson

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Castlemaine Field Naturalists Club contributes to Central Victorian cemetery surveys

Ern Perkins[1], Lesley Perkins[1] & Deanna Marshall[2]

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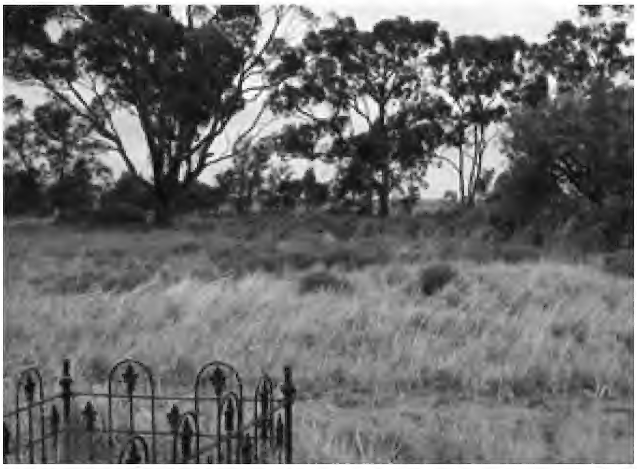

Figure 1. Mysia cemetery, surrounded by a sea of agriculture, has one of the most beautiful remnants of Kangaroo Grass in the district. Photo: Deanna Marshall

Cemeteries as refuges

It is well known that cemeteries can contain some of the best examples of remnant vegetation and, in some cases, the only remnant vegetation in an area. Cemeteries often act as 'refuges' for threatened species, natural ecosystems and germplasm material (Fig. 1). For the past three years, members of the Castlemaine Field Naturalists Club have surveyed cemeteries across eight Shires in Central Victoria. The aim of the surveys was to document the indigenous flora and provide an overall rating of the significance of the cemetery reserves. This allows the Department of Sustainability and Environment (DSE) to provide advice to the Department of Human Services (DHS) with regard to land management practices to ensure both statutory obligations are met and best practices employed.

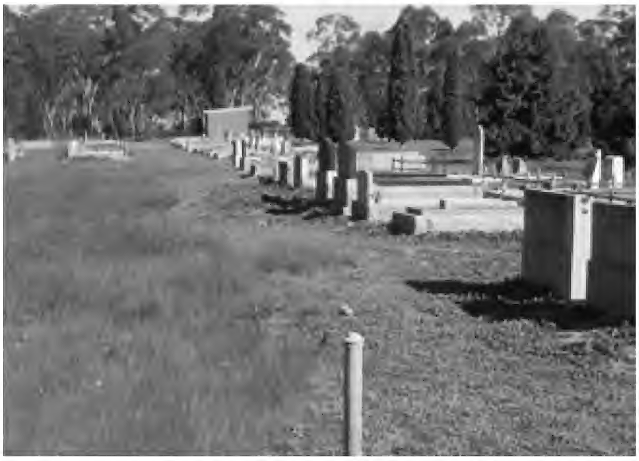

Figure 2. Weeds colonising a sprayed area of Goornong Cemetery. Compare to the native grassland flora existing nearby (at left). Photo: Ern Perkins

Methodology

We aimed to visit the cemeteries at least three times, unless the reserve was seriously degraded. Visits were in spring, early summer, and autumn or winter. Plants were recorded for the whole site. If planted exotic or non-local species were readily identified we included these on our list. We also recorded threatening processes which might impact the native vegetation. Except where the vegetation was severely degraded, we set up a 30 metre square quadrat and recorded the species present and their cover / abundance. In addition, we made a list of birds seen during our visit with the aim of giving some kind of indication of the value of the cemetery as bird habitat.

We provided DSE with a brief report on each of 166 cemeteries. The reports included geographical coordinates, a description of the land use on the site and surrounds, details of fencing, a list of rare flora species recorded, and an assessment of the conservation value of the cemetery. We also provided photographs, showing some of the features of each cemetery reserve, and an aerial photo was scanned, and the position of fences shown and areas labeled to indicate grasslands, burial areas and other features. DSE are entering the data into their statewide databases.

Threats

Most management committees take pride in their cemeteries, however, income from burials has not kept pace with costs, and most cemeteries operate on very limited budgets. Some cemeteries are not being managed so that conservation outcomes are maximised. One of the most destructive management practices in cemetery reserves is the widespread use of herbicide (Fig. 2). Sometimes the entire cemetery reserve had been sprayed. The other very destructive activities were cultivation and over grazing. An example of a cemetery not well-managed for conservation was the Quambatook Cemetery. This had a small burial section with another section that was unfenced from the adjoining farmland and sown to wheat. A further area was fenced off for grazing, and part had been used for a quarry.

Fine examples

Fourteen of the surveyed cemeteries had high to very high conservation status. An excellent example was Taradale Cemetery where herbicide had been used only in the gaps between graves, and the area close to the graves was closely mown, to allow suitable conditions for people at gravesides. The outer grassland areas were slashed in early summer, to reduce the fuel load. Some of this slashed area was dominated by Kangaroo Grass (*Themeda triandra*) and Spear Grass (*Stipa* spp.), and also present was a myriad of other native grasses and herbs. Taradale Cemetery also had a small bushland area that, hopefully as a result of this study, will be managed for biodiversity.

Threatened species records have included Matted Flax-lily (*Dianella amoena*), Late-flower Flax-lily (*Dianella tarda*) (Fig. 3), Arching Flax-lily (*Dianella* sp. aff. *longifolia* Benambra), Northern Golden Moths (*Diuris protena*), Buloke Mistletoe (*Amyema linophylla* ssp. *orientale*), Golden Cowslips (*Diuris behrii*) and Oval-leaf Pseudanthus (*Pseudanthus ovalifolius).*

This is a long term project that will hopefully see the permanent protection of some of the high quality cemetery reserves in partnership with the local committees of management, DHS and DSE.

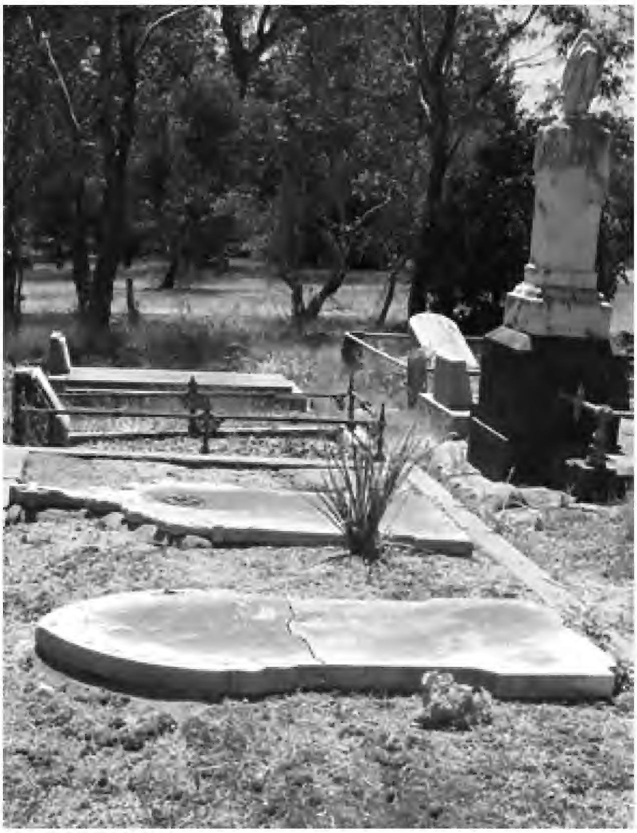

*Figure 3. The threatened Late-flower Flax-lily (*Dianella tarda*) has been recorded in Sandon Cemetery. Photo Deanna Marshall*

Botanic Guardians Grants

These cemetery surveys have been funded by a Botanic Guardians Grant coordinated by the Department of Sustainability and Environment. These grants target community groups to assist with the conservation of rare or threatened plant species or plant communities. The grants are up to a maximum of $3,000 and can be applied for at any time of the year. Members of the Castlemaine Field Naturalists have had many such grants over the past eight years to undertake different conservation activities in the region.

Acknowledgements

Thanks to Norm Stimson of DSE Crown Land Management for providing all the maps, aerial photos, project initiation and support.

Practical voluntary orchid conservation in Victoria

Andrew Dilley

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Introduction

An increasing observation by Australasian Native Orchid Society members during field trips into the Victorian bush is that orchid habitats are in decline as pristine habitats become degraded. The loss of orchids from an area may indicate that deleterious land-use practices are inhibiting important biological processes for orchid persistence. Human-induced activities that may contribute to population decline in orchids include trampling, clearing or the nutrient enrichment associated with the introduction of fertilizers, or chemicals. Orchid abundance may also decline if necessary pollinators disappear from an area following loss of associated vegetation required by the pollinator.

As a result, the Australasian Native Orchid Society, Victorian Group (ANOS Victoria) has taken a pro-active, hands-on approach to orchid conservation. ANOS Victoria is now involved in many ways with orchid conservation. Our activities include monitoring, searching, environmental management, weeding, species identification, translocation, orchid propagation, establishment of *ex situ* populations, reintroduction into the wild and the promotion of awareness of our natural orchid heritage.

Case Study 1 – *Prasophyllum suaveolens*

ANOS Victoria has directed its efforts to a number of populations of endangered orchid species. Populations targeted include those that were otherwise receiving little in the way of resources or attention. All work carried out was undertaken under the guidance of the responsible authorities and in accordance with recovery plans that had been prepared.

Our first adopted population was of *Prasophyllum suaveolens* (Fragrant Leek Orchid) at a small country cemetery site. Only a few people were aware of the existence of this isolated colony, believing that the best way of protecting the orchid was to keep its existence a secret from unscrupulous collectors that could destroy the single known population. However, lack of community awareness was leading to the orchid's demise. The orchid's habitat was being invaded by the weeds *Watsonia* spp. and English Broom (*Cytisus scoparius*). Also, the orchids were being mown every spring as they were coming into flower, preventing seed from being produced. When ANOS Victoria first visited the site to see what needed to be done, anecdotal evidence suggested that abundance had declined in recent years to 39 individuals.

This site had several layers of management. The Cemetery Trust managed the site and burial allotments. The local council was responsible for mowing, which was undertaken by private contractors. The Victorian Department of Sustainability and Environment (DSE) also had a vested interest in the site.

Active orchid conservation

To stimulate germination an applied burn was implemented in consultation with DSE and the Cemetery Trust and carried out by local Country Fire Authority and DSE personnel, but this had to be done in conjunction with a careful weed control program. This involved hand weeding of English Broom and the application of herbicide by wiping on individual plants of *Watsonia* spp. Following the burn a mowing regime was developed and implemented, which aimed to permit the orchids to flower and set seed. Since 2000, ANOS Victoria has annually monitored the orchids. A total of 277 distinct individuals have been recorded, with 174 flowering plants being observed in a year following fire. The site has been burnt three times since 2000 and ANOS Victoria conducts annual hand weeding. Due to the

Top: Monitoring Pterostylis despectans. *Bottom: Removing* Watsonia *from* Diuris punctata *site. Photos: Andrew Dilley*

fragmented habitat and specific use of the site as a cemetery, the *Prasophyllum suaveolens* population will need ongoing human intervention to cater for the ecological requirements of the grassland community and its threatened species.

Case Study 2 – *Pterostylis despectans*

Our second target orchid species was *Pterostylis despectans* (Lowly Greenhood). This species grows in State Forests in the central Victorian gold fields region. This species is listed as endangered under the Victorian *Flora and Fauna Guarantee Act 1988.* Threats include digging by White-winged Choughs, a native bird that eats the orchid's tubers, and physical disturbance by gold prospectors that work over the area. In 2000 there were four known populations and an anecdotal estimation of abundance of 500 mature individuals.

ANOS Victoria began by establishing three monitoring sites across two populations, recording plant emergence, flowering and seed set. Extension surveys were also conducted to locate new populations. Potential habitat was identified using the geographic distribution of associated species recorded at known sites as a surrogate. The Victorian Government's Flora Information System (FIS) was used to locate areas suitable for extension survey based on the distribution of surrogate species.

The benefits of more eyes looking...

Since 2000 ANOS Victoria have conducted extensive searches and have identified more than thirty new populations covering a range of about 70 km, a significant increase from the prior known geographic range of approximately 15 km. Plant abundance is recorded at each of the known sites annually and the current total estimate is approximately 5500 mature individuals. Although abundance estimates have been increasing yearly, this has been mostly due to locating new populations and not any real improvement in the species' status. Rather, the extended drought in the region over the past six years and the ongoing damage caused by White-winged Choughs has lead to abundance declining by an average of 12% per annum in the three monitored sites. To safeguard against future losses ANOS Victoria obtained a permit to collect orchid seed and material and is working on establishing an *ex situ* population of *Pterostylis despectans*. Astute ANOS Victoria members discovered that the damaged orchid material left by the Choughs, which would normally dry out and die in the field, can be placed in a terrestrial orchid propagating mix and if kept moist will often grow a root and establish a new tuber. Orchids are caged where they look like they have a high probability of flowering, but this action is funding-dependent.

Other orchids projects

Since establishing these two orchid projects ANOS Victoria has increased its involvement with other orchid conservation projects. ANOS Victoria provides assistance to the Melbourne Zoo which has established a large *ex situ* population of *Diuris fragrantissima* (Sunshine Diuris), an orchid almost extinct in the wild. ANOS Victoria helps the zoo deflask orchid seedlings, grows plants in its own collections so that the entire remaining population is not held at a single location, and assists with re-establishing new colonies in the wild by monitoring their progress.

VicRoads has called upon ANOS Victoria when orchids are in the path of proposed roads and freeways. ANOS

Restoring Caladenia versicolor *habitat after the Grampians fires. Photo: Colin Rowan*

Victoria assists with the translocation of the orchids and have cared for the plants off-site while new translocation sites are established. Our members have been called in by local councils and the Ports and Harbours Authority to consult and assist with various site management issues where orchids grow. ANOS Victoria also assists 'friends' groups and involves Field Naturalist groups in the Society's activities, as locals are well suited to keeping a regular eye on sites that ANOS Victoria cannot visit regularly. The Victorian Department of Sustainability and Environment and Parks Victoria often call upon ANOS Victoria to assist with their conservation work as a result of the successes in conserving *Pterostylis despectans*. ANOS Victoria now conducts similar monitoring and searching activities for other endangered orchid species.

Translocating Diuris behrii. *Photo: Geoff Nevill*

An essential part of being able to undertake orchid conservation is funding. Through grant applications and donations ANOS Victoria has received over $45,000. This has been used for equipment, herbicide, fencing and caging materials, paying for applied burns and to assist members with transport costs associated with extension surveys and monitoring.

For more information

For further information about the activities of ANOS Victoria visit the web site at www.anosvic.org.au.

A librarian with a green thumb, enthusiastic kids and an intriguing rare plant

Deanna Marshall

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Community Spirit

Melanie Robinson's day job is a librarian based in Bendigo, Victoria, but outside of her normal role, she has become a 'guardian' to a locally endangered plant. Melanie completed a unit on native seed collection and storage as part of the Diploma of Natural Resource Management at the local TAFE. This prompted Melanie to inquire about the work that the Department of Sustainability and Environment's (DSE) Biodiversity Group undertakes with regards to local threatened flora species. We interpreted this as an invitation for Melanie to assist with our threatened species program and asked if she would be interested in trialing germination of some of our rare Flax-lily species, in particular, the species that don't receive funding through the usual sources.

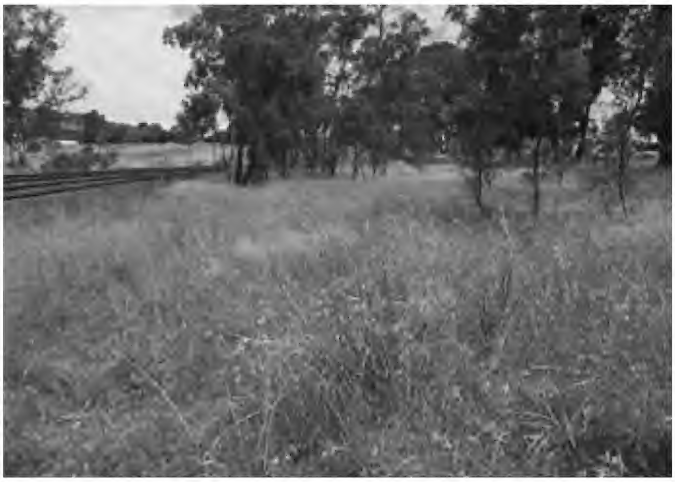


Figure 1. A high quality rail reserve remnant containing Late-flower Flax-lilies in Harcourt, Victoria. Photo: Deanna Marshall

Late-flower Flax-lily

The Late-flower Flax-lily (*Dianella tarda*) is considered to be vulnerable in Victoria. It is a tall perennial herb flowering from late spring through to mid summer, opening its flowers in the mid-late morning through to very late in the evening, hence the specific epithet '*tarda*', meaning tardy or slow. The distribution of Late-flower Flax-lily is confined to northern and north-western Victoria and southern New South Wales. It occurs in remnant grassy woodlands, usually on roadsides and rail reserves where cultivation has been absent (Fig. 1). Past land clearing and agricultural activities have dramatically impacted on grassy woodland ecosystems including Late-flower Flax-lily populations. They are also highly susceptible to browsing by rabbits, hares and sheep, and to a lesser extent, macropods.

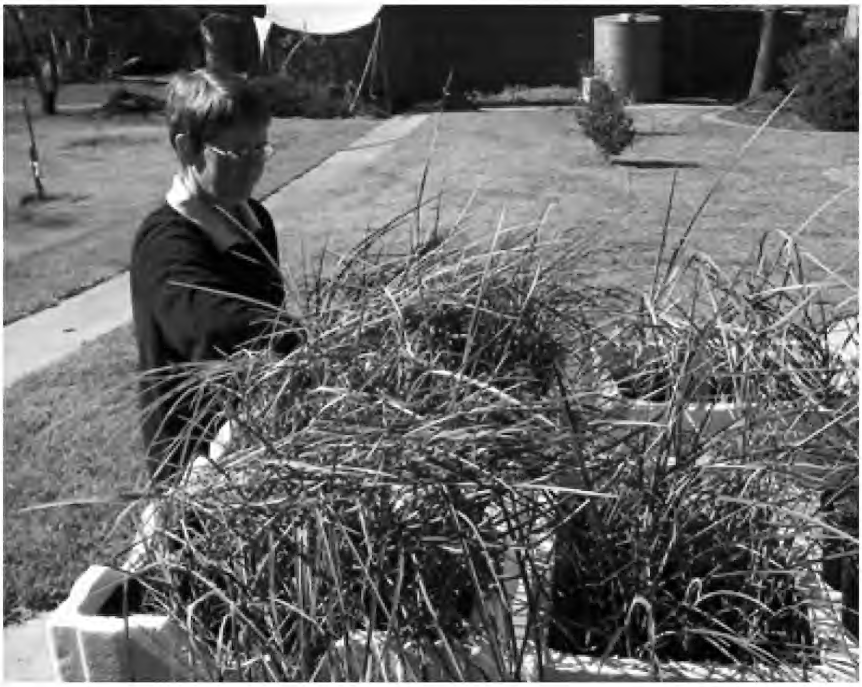


Figure 2. Melanie Robinson – master grower of Late-flower Flax-lilies. Photo: Deanna Marshall

Botanic Guardians Grants

We organised a small Botanic Guardians Grant for Melanie to cover the cost of her materials. These grants are coordinated by DSE, targeting community groups to assist with the conservation of rare or threatened plant species or plant communities. The grants are up to a maximum of $3,000 and can be applied for at any time of the year.

Propagation & Planting

Melanie received numerous packets of seed collected by DSE flora project officers and mastered the germination of Late-flower Flax-lily by using smoked water. When the seedlings were ready for planting out (Fig. 2), Harcourt Valley Primary School was approached by DSE to be the recipients of the local population of plants as part of the nationally celebrated 'Threatened Species Day'. The young students were very willing participants, planting over 400 Late-flower Flax-lilies into their native garden (Fig. 3). Threatened species Fact Sheets were also provided to the school to help with interpretation (available on DSE's website: www.dse.vic.gov.au).

Acknowledgements

Without community support and dedication most of our threatened species programs would not succeed. Thanks and gratitude to staff and students at Harcourt Valley Primary School and Melanie Robinson for contributing to the survival of this species in the wild.

Figure 3. Students of Harcourt Valley Primary School planting Late-flower Flax-lilies into their indigenous garden. Photo: Deanna Marshall

Habitat recovery of the threatened species Moonee Quassia

Sally Mathews & Justin Couper

Environmental Training and Employment (EnviTE NSW), North Coast, NSW. Email sallym@envite.org.au; justinc@envite.org.au

Species information

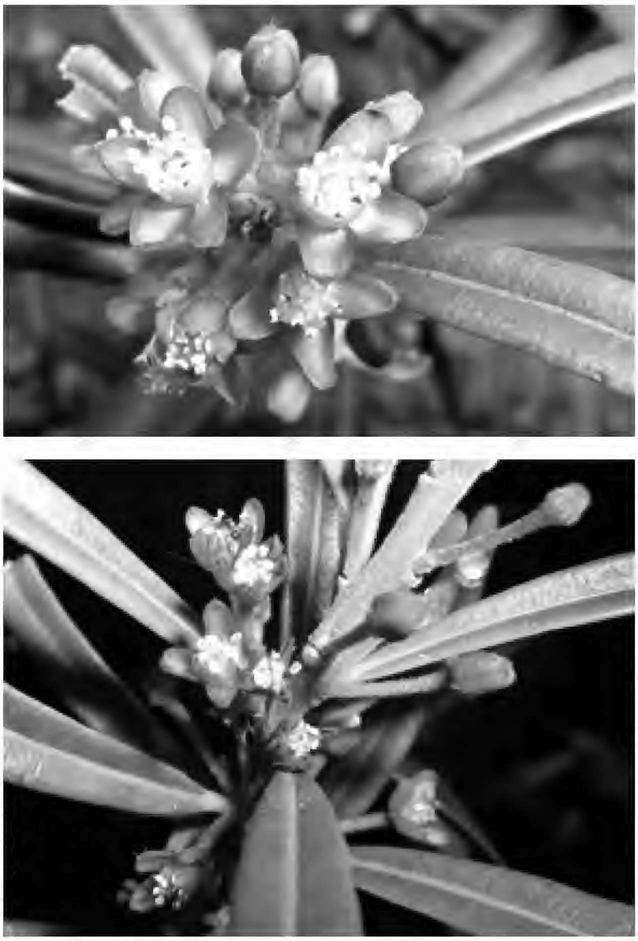
The Moonee Quassia (*Quassia* sp. Mooney Creek) is a shrub/small tree that grows to 2 metres high. The species is endemic to the north coast of New South Wales and is currently only known from 18 locations between Moonee Beach (near Coffs Harbour) in the south and McCraes Knob (east of Ulmarra) in the north. The Moonee Quassia is listed as Endangered in both state (*Threatened Species Conservation Act 1995*) and federal (*Environmental Protection and Biodiversity Conservation Act 1999*) legislation. The habitat of the Moonee Quassia at coastal sites is wet sclerophyll forest, with a canopy typically comprising species such as Tallowwood (*Eucalyptus microcorys*), Brushbox (*Lophostemon confertus*), Turpentine (*Syncarpia glomulifera*) and Forest Oak (*Allocasuarina torulosa*). Varying density and diversity of rainforest understorey species usually occurs within this habitat. Habitat of the Grafton district populations includes tall dry Eucalypt forests of Needlebark Stringybark (*Eucalyptus planchoniana*) and Large-fruited Blackbutt (*Eucalyptus pyrocarpa*) above a well-developed shrub layer.

Threats to the long-term survival of the Moonee Quassia include low population numbers, weed infestation, grazing and fire (DEC 2005). Weeds threatening Moonee Quassia specifically at the Moonee locality include Lantana (*Lantana camara*), Groundsel bush (*Baccharis halimifolia*), Ochna (*Ochna serrulata*) and Broad-leaf Paspalum (*Paspalum wettsteinii*).

Project background

The recovery initiative for the Moonee Quassia population in the Moonee locality began when a local landowner and bush regenerator for EnviTE (and one of the authors) Justin Couper, discovered the threatened species on his property and applied for funding to manage threats by removing weeds from the bushland area of his block.

An overview of the funding sources, project names and duration, as well as summary statistics, is contained in Table 1. The initial allocation of funding towards habitat recovery came from the Coffs Harbour Council's Environmental Levy Community Grants scheme in 2004. Further funding from the Northern Rivers Catchment Management Authority (NRCMA) enabled a continuation of the work. Wetland Care Australia and EnviTE NSW have been responsible for implementing these project contracts. The work that has been undertaken aimed to implement actions from the existing Recovery Plan.



Flowers of the threatened species Quassia *sp. Mooney Creek (Moonee Quassia). Photo: Justin Couper*

The *Recovery Plan Quassia sp. Mooney Creek (Moonee Quassia)* was prepared by the Department of Environment and Conservation (now Department of Environment and Climate Change) in 2005.

The initial NRCMA project brief *Threatened Flora Recovery Plan Implementation* had a strong emphasis on community consultation and listed the following objectives:

- liaising with and educating the community to increase the awareness of the features and the risks to the survival of Quassia plants;
- locating new Quassia plants and assessing the threats and suggesting management strategies for each site;
- reaching agreements with landowners to protect Quassia plants or populations on private land;

- protecting sites from further disturbance in consultation with landowner; and
- undertaking weed control work that will assist in the recovery of the species.

This NRCMA funding allowed for expansion of habitat recovery onto seven properties in which Moonee Quassia was recorded. During the third year, habitat recovery works commenced on three additional properties together with three properties receiving follow-up work. This latest round of funding concluded in June 2007.

Working with Landholders

The key to restoring and enhancing threatened species habitat on private and leasehold land is to gain access to properties and support from landowners and managers. There are many factors contributing to a landholder's willingness to be involved and to commit to an environmental restoration project of this nature. Many landholders are uninformed about the local ecology and once educated are willing to assume responsibility for protecting bushland on their block. For landholders to recognize that the Moonee Quassia is limited in its range and at risk of possible extinction, and that their land is one of the few places in the world were this species exists, creates an appreciation of the landscape overall and a greater understanding of the special place in which they live.

The following strategies were used by the project co-ordinator (a local landowner) to encourage landholders to participate in the project:

- local knowledge and informal approach to neighbours (25%);
- sirect approach prior to mail out (25%);
- word of mouth between members of the community (25 %);
- response to project promotion, mail-out (17 %); and
- door-knock following mail-out (8 %).

These approaches resulted in 12 landowners communicating their willingness to be involved. All but one landholder committed to the project; reluctance to commit was due to past experiences dealing with a government agency.

Having a local coordinator, responsible for recruitment and liaison as well as overseeing the work, led to the success of the project. This approach meant there was someone happy to wear the label 'bush regenerator / environmental expert', answer questions and demonstrate techniques. The fact that this individual was also committing to similar obligations as other participating landholders helped create a sense of security with other landholders.

All projects funded by the NRCMA require a signed agreement between the NCRMA and the landowner. These *Landholder Management Agreements* specify that landholders will carry out follow-up weed control work for five years. To help build capacity, landholders were given 'on the job' training in plant identification and weed control techniques when EnviTE bush regenerators were active on their properties. All landholders participated. Information packs on weed control techniques were supplied as a resource to facilitate follow-up work.

Working under a Department of Environment and Climate Change recovery plan

Working under a formal recovery plan gave the project depth by providing clear objectives and avenues to build on current knowledge about the species. Working in such a way provides opportunities for individuals involved in the project to research questions and answers about the specific ecology of the Moonee Quassia. A Department of Environment and Climate Change threatened species officer and a EnviTE officer worked together to establish monitoring quadrats and assessment protocols.

Discovery of a moth feeding on Quassia

During the project caterpillars were noted to be feeding on the flowers of the Moonee Quassia. The Entomology Department at the Australian Museum was contacted and live caterpillars were sent to Sydney for identification. The pupae were grown to adulthood under laboratory conditions and the moth which emerged was identified as

Table 1. Overview of project

Year	Funding Source & Program	Name of Project	Budget for works (approx)	Time-frame	Achievements		
					No. of sites	Area worked	Work
2004-5	Coffs Harbour City Council. Environmental Levy	Moonee Quassia Protection Project	$7000	1 year	4	0.83 ha	Weed control
2005-6	NRCMA- Investment Strategy. Biodiversity Theme	Implementation of Threatened Species Recovery Plans on Private Land	$33500	7 months	7	25.24 ha	430m fencing. Weed control
2006-7	NRCMA Investment Strategy. Biodiversity Theme	Threatened Species Habitat Enhancement: Moonee Quassia	$25000	1 year	6	23.83 ha	Weed control

Atteva albiguttata. The larvae of this moth are known to feed on other plants in the Simaroubaceae family and are found not only in Australia but also in South America where other Quassia species occur. This ecological relationship may date back to Gondwana. A factor for future consideration is whether the presence of caterpillars on Quassia flowers has an important impact on the Moonee populations.

Conclusion

The habitat recovery of the threatened species Moonee Quassia in the locality of Moonee has been a successful project to date. Eleven landholders have become involved and have received primary weed control work on their properties. Those who joined the project felt a greater sense of community.

There are a number of properties in the locality with known Moonee Quassia populations that are yet to become involved and it may take further negotiations and 'deal-making' to win these landholders' interest. There is satisfaction however, in knowing that the majority of landholders in the local community are involved and better informed about the significance of this plant, and that the current populations on these properties are more secure than they were prior to the project.

It is not only landowners who become better informed as a result of habitat recovery of plant species. Bush regenerators working amongst threatened plant species also have an opportunity to increase their scientific knowledge, which can be both essential and challenging.

Habitat recovery of Moonee Quassia over the past three years has involved local landholders, local and state government departments as well as non-government organisations, all of whom have an important role to play in implementing threatened species recovery actions. Local contacts can be a critical lever to win over the local community and create project momentum. Funding and project administrators have changed throughout the life of the project but the bush regeneration contractors have remained the same. This fact, together with the increase in funding has helped realise increasing landholder involvement in this work. The NRCMA, working with EnviTE, is now asking 'where to now' in regards to habitat recovery of this species.

References

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Acknowledgement

EnviTE would like to acknowledge Mark Graham from Wetland Care Australia, John Nagle from the Northern Rivers Catchment Authority and Dianne Brown from Department of Environment and Climate Change for their contributions to this project.

ANPC @ Floriade

The ANPC was recently involved in 'Floriade', Canberra's floral extravaganza. We promoted the ANPC, our upcoming events and publications, and Rosemary Purdie and Sally Stephens gave a talk using our PowerPoint presentation. At least one registration for the upcoming plant identification course arose from this opportunity.

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Report from New Zealand Plant Conservation Network

Bec Stanley

Email: rebecca.stanley@arc.govt.nz

New Zealand Noah's Ark for plants is opened

The MWH Threatened Plant Seed Bank, New Zealand's first seed bank for native species, was officially opened on Thursday 16 August 2007 in Palmerston North by the Conservation Minister the Hon. Chris Carter. The threatened plant seed bank is located at AgResearch's purpose-built Margot Forde Germplasm Centre in Palmerston North. New Zealand Plant Conservation Network president Ian Spellerberg noted that 'in many respects it was a sad day, acknowledging that we have to rely on *ex situ* measures to conserve our flora because of the ever growing pressures on our plants in their wild habitats'.

Seed of *Atriplex hollowayi*, a Nationally Critical coastal herb that grows on the coastal dunes of Northland, were the first seeds in the bank, handed over by the Maori tribe Ngati Kuri, who are guardians of the area where the *Atriplex* grows in the far north of New Zealand. Children from a local school received the seed, which were blessed by local Maori, and then taken away to be lodged in the seed bank.

The first seed in the seed bank was from Atriplex hollowayi, *a critically endangered strandline herb now lost from over 90% of the sites it was recorded from in the past.*
Photo: Bec Stanley

Conservation Minister Chris Carter inspecting the seed bank with Warren Williams, the Curator of the Margot Forde Germplasm Centre. Photo: John Sawyer

View *Trilepidea*, the E-Newsletter of the New Zealand Plant Conservation Network:

August 2007
http://www.nzpcn.org.nz/documents/Trilepidea-45-070822.pdf

September 2007
http://www.nzpcn.org.nz/documents/Trilepidea-46-0709.pdf

October 2007
http://www.nzpcn.org.nz/documents/Trilepidea-47-071016.pdf

An archive of *Trilepidea* is at: http://www.nzpcn.org.nz/newsletter_publications/newsletter_archive.asp

To join the New Zealand Plant Conservation Network, go to: http://www.nzpcn.org.nz/how_to_join/index.asp

Research Roundup

Current perspectives in plant conservation biology. *Australian Journal of Botany* 55(3) whole issue. Includes an introduction and 20 articles on the following themes: Rarity and Threat, Population Biology and Genetics, Patterns of Biodiversity, *Ex situ* Conservation and Reintroduction and Restoration Ecology. Among the articles are:

- Collateral benefit: unconscious conservation of threatened plant species.
- Conservation biology of banksias ...
- *Phytophthora cinnamomi* invasion, a major threatening process ...
- Plant mating systems and assessing population persistence in fragmented landscapes.
- Seeing the wood and the trees – predicting the future for fragmented plant populations in Australian landscapes
- Scientific approaches to Australian temperate terrestrial orchid conservation.
- Seed quality for conservation is critically affected by pre-storage factors.

Research Roundup (continued)

Bjerknes, A-L., Totland, O., Hegland, S.J. and Nielsen, A. (2007). **Do alien plant invasions really affect pollination success in native plant species?** *Biological Conservation* 138(1-2): 1-12.

Chalmers, A., Bakewell, G. and Taggart, A. (2007). **Improved growth and survival of deep-planted long-stem tube-stock within a rainforest edge on the Central Coast of New South Wales: Preliminary results.** *Ecological Management and Restoration* 8(2): 152-154.

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Gibson-Roy, P., Delpratt, J. and Moore, G. (2007). **Restoring the Victorian Western (Basalt) Plains grassland. 1. Laboratory trials of viability and germination, and the implications for direct seeding.** *Ecological Management and Restoration* 8(2): 114-122.

Gibson-Roy, P., Delpratt, J. and Moore, G. (2007). **Restoring the Victorian Western (Basalt) Plains grassland. 2. Field emergence, establishment and recruitment following direct seeding.** *Ecological Management and Restoration* 8(2): 140-143.

Liston-Burgess, G. (2007). **Letting down the marshes.** *Ecos* 137: 20-23.

Lunt, I.D., Eldridge, D.H., Morgan, J.W. and Witt, G.B. (2007). **A framework to predict the effects of livestock grazing and grazing exclusion on conservation values in natural ecosystems in Australia.** *Australian Journal of Botany* 55(4): 401-415.

Reid, A.M. and Hochuli, D.F. (2007). **Grassland invertebrate assemblages in managed landscapes: effect of host plant and microhabitat architecture.** *Austral Ecology* 32(6): 708-718.

Shannon, J.M. and Morgan, J.W. (2007). **Florisitic variation in *Sphagnum*-dominated peatland communities of the Central Highlands, Victoria.** *Cunninghamia* 10(1): 59-76.

Silcock, J. and Page, M. (2007). ***Melaleuca densispicata* in Currawinya National Park, South-West Queensland: Ecology and preliminary implications for management of a rare plant species.** *Ecological Management and Restoration* 8(2): 145-147.

Thomas, P.B., Morris, E.C. and Auld, T.D. (2007). **Response surfaces for the combined effects of heat shock and smoke on germination of 16 species forming soil seed banks in south-east Australia.** *Austral Ecology* 32(6): 605-616.

Williams, P., Collins, E. and Crafter, C. (2007). **Dynamics in tropical sandstone vegetation in north-west Queensland: Insights for management.** *Ecological Management and Restoration* 8(2): 143-144.

Wong, N.K., Dorrough, J., Hirth, J.R., Morgan, J.W. and O'Brien, E. (2007). **Establishment of native perennial shrubs in an agricultural landscape.** *Austral Ecology* 32(6): 617-625.

Ye, Q., Bunn, E., Krauss, S.L. and Dixon, K.W. (2007). **Reproductive success in a reintroduced population of a critically endangered shrub, *Symonanthus bancroftii* (Solanaceae).** *Australian Journal of Botany* 55(4): 425-432.

Information Resources and Useful Websites

Rainforest Climbing Plants

Gwen Harden, Bill McDonald & John Williams

Gwen Harden Publishing, Nambucca Heads, Nov. 2007

http://www.rainforests.net.au

A field guide to the identification of 265 species of climbing plants in rainforests in Victoria, New South Wales and subtropical Queensland, using vegetative features, such as leaves and climbing mechanisms. There are illustrated keys to groups and species. Native and weedy species are included. There are comprehensive species descriptions, with information on habit, rainforest type in which the species occurs, geographic range and description of leaves, flowers and fruit. All species are illustrated. 192 pp. (paperback). RRP $40.

Enviro News
A newsletter about environmental management on Lord Howe Island

http://www.lordhoweisland.info/environ/enviro_news.htm

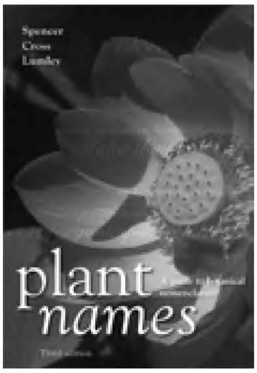
This newsletter is published by the Environment Unit of the Lord Howe Island Board, and is available as a downloadable pdf. The latest issue (for Summer 2007) contains articles on: Woodhen survey, invasive species, a Draft Biodiversity Management Plan for Lord Howe Island, environmental works (such as weeding, with a total of 1,030,047 weeds reported as removed) and current research projects on the Island.

Plant Names: a Guide to Botanical Nomenclature Third Edition

Roger Spencer, Rob Cross and Peter Lumley

CSIRO Publishing, Nov. 2007

http://www.publish.csiro.au/pid/5707.htm



Plant Names is a plain English guide to the use of plant names and the conventions for writing them as governed by the *International Code of Botanical Nomenclature* and the *International Code of Nomenclature for Cultivated Plants*. It covers the naming of wild plants, plants modified by humans, why plant names change, their pronunciation and hints to help remember them. There also is a detailed guide to web sites and published resources useful to people using plant names.

The book incorporates the latest information in the most recently published Botanical and Cultivated Plant Codes, both of which are technical scientific publications that are difficult to read for all but the most dedicated botanists and horticulturists. From botanists to publishers, professional horticulturists, nurserymen, hobby gardeners and anyone interested in plant names, this book is an invaluable guide to using the potentially confusing array of scientific, commercial and common names. 176 pp. Paperback. ISBN 9780643094406. RRP $39.95.

Natural Resource Management Projects

http://www.nrm.gov.au/index.html

A mosaic map on the Australian Government Natural Resource Management (NRM) home page allows access to lists of selected NRM-funded projects at state and regional level. Within each NRM region, individual projects are mapped, and indicated as site specific or region wide. There is a description of the funding and activities of each of the featured projects.

Projects include: in the **South Coast** NRM region of Western Australia: 'Gondwana Link' a project to restore ancient landscapes by creating a 1,000 km stretch of native bushland from the desert to the tall-tree forests of the coast; in the **Northern Territory**: 'Weeding out the problem', a project to tackle extensive weed problems along the Sandover and Bundy Rivers; in the **Northern and Yorke** NRM region of South Australia: 'Bringing the Spiny Daisy back from the brink'; in the **Burnett Mary** NRM region of south-east Queensland: planting an indigenous bush food and medicine corridor on the banks of the Burnett River; in the **Southern Rivers** NRM region of New South Wales: the Bega community seedbank; in the **Goulburn Broken** NRM region of Victoria: preparation of a manual to help real estate agents identify and describe land with environmental values; and in the **South** NRM region of Tasmania: eradication of African Feather Grass.

ANPC Conference and Workshop

ANPC 7th National Conference
Our declining flora – tackling the threats

PUT THIS IN YOUR DIARY NOW!

21 –24 April 2008

Location: Mulgoa NSW (near Penrith, western Sydney).

The ANPC and Mount Annan Botanic Garden invite you to a conference on threatening processes in plant conservation. Papers and suggestions for workshop topics are also invited.

The conference will focus on four main sub-themes:

- types of threat;
- responding to threats at the species level;
- responding to threats at the plant community level; and
- responding to threats at the landscape level.

For more information, see the back cover of this issue and the ANPC website http://www.anpc.asn.au/conferences.html

Identifying plants of grassy ecosystems of the ACT region – a field-based course

Thursday 22 & Friday 23 November 2007

Canberra

Improve your skills in identifying plants of the ACT region and learn to recognise species which indicate the conservation value of a site.

You can register for one or both days. Day 1 is for beginners and day 2 is for those with more experience. Registrations CLOSE on 12 November.

This course is supported by an ACT Environment Grant

Further information:
http://www.anpc.asn.au/canberra20071122.html or contact the ANPC office (anpc@anpc.asn.au; ph: 02-6250 9509).

Contact the ANPC Office for further information on the workshop or conference

Phone: 02-6250 9509 Email: anpc@anpc.asn.au
Web: http://www.anpc.asn.au

Conferences and Workshops

WILDCARE National Conference 2007

Volunteering for wild places, wildlife and cultural heritage

23-25 November 2007
Hobart, Tasmania

To celebrate our 10th Anniversary WILDCARE Inc. is inviting volunteers, volunteer organisations, foundations, NGOs, government agencies and their staff to a conference in Hobart in November.

WILDCARE is a not-for-profit, volunteer organisation whose members provide time, effort, intellect and funding to a myriad of projects and programs in reserve management, visitor services, community education, for nature conservation (on both public and private land), rehabilitating and rescuing wildlife and supporting cultural heritage conservation, in partnership with state and local government and private landholders. WILDCARE is a keen promoter of cooperative partnerships with reserve managers, private landholders, wildlife managers and cultural heritage managers, with the aim of making a real difference in the real world. WILDCARE promotes sharing ideas, developing new approaches and lending a practical hand to others.

This conference presents the opportunity for volunteers, volunteer and other community organisations, volunteer program managers and staff from partner agencies to get together and take some time to build better ways to work together towards a healthy reserve system, a protected cared for and rehabilitated environment and wildlife (plants and animals), protected and cared for cultural heritage and sites and an educated and aware community.

Further information: Office@wildcaretas.org.au or visit www.wildcaretas.org.au

Association of Friends of Botanic Gardens 2008 Conference

Where Passion Bears Fruit

4-6 April 2008
Clover Hill Function Centre, Orange Botanic Gardens

The conference will be conducted over two days and consist of lectures, workshops and walks. Speakers include: Steve Corbett (former Director: RBG Hobart, current Director: Centennial Park & Moore Park Trust), Peter Mortimer (Advertising Account Executive WIN & NBN TV) and Mary Moody (Horticulturalist, author and tour guide).

The general theme of the conference is ‘Practical aspects of Friends’ activities’. Topics to be covered include:

- value of Volunteering;
- event Management;
- maintaining a Friends Group; and
- sponsorship & Fundraising.

The conference is hosted by Friends of the Orange Botanic Gardens, NSW. Secretariat: Jane Arnott: ph: 02-6362 0039. Conference booking form (click on Events in the menu to the left of screen and scroll to the bottom of the page): http://www.friendsbotanicgardens.org/

16th Australian Weeds Conference

Weed Management 2008 – hot topics in the tropics

18-22 May 2008
Cairns Convention Centre, Queensland

This conference is hosted by The Weed Society of Queensland Inc. The conference will showcase recent advances in weed science, extension and policy across Australian and international communities and landscapes. The program for the conference includes plenary, oral, and poster sessions and trade exhibitors. The conference will appeal to anyone involved in weed R & D, management and extension and will be a great opportunity to build new networks and explore existing ones.

Keynote speakers and their presentations include:

- Julie Denslow (Institute of Pacific Island Forestry) – The Pacific Islands: Model systems for understanding invasions and impacts of exotic plants.
- Rodd Dyer (Meat And Livestock Australia) – Weeds in the grazing lands of northern Australia: a livestock industry perspective.
- Prof. Paul Martin (University Of New England) – Cross pollination or cross-contamination? Directions for informing the management of invasives with market-economy concepts.
- Prof. Timothy Reeves (Timothy G. Reeves and Associates P/L) – Global Changes: Impacts on Weeds in Cropping Systems.

Further information: http://www.16awc.com.au/

Botanic Gardens of Australia and New Zealand 2008 Conference

6-9 September 2008
Eurobodalla Regional Botanic Gardens, near Batemans Bay, NSW

The 2008 conference will encourage the sharing of the secrets of success in areas of expertise. Everyone with an interest in Botanic Gardens is invited.

ANPC Corporate Members

ANPC acknowledges the support of the following corporate members

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Department of Environment and Conservation, WA

Dept of Sustainability and Environment, VIC

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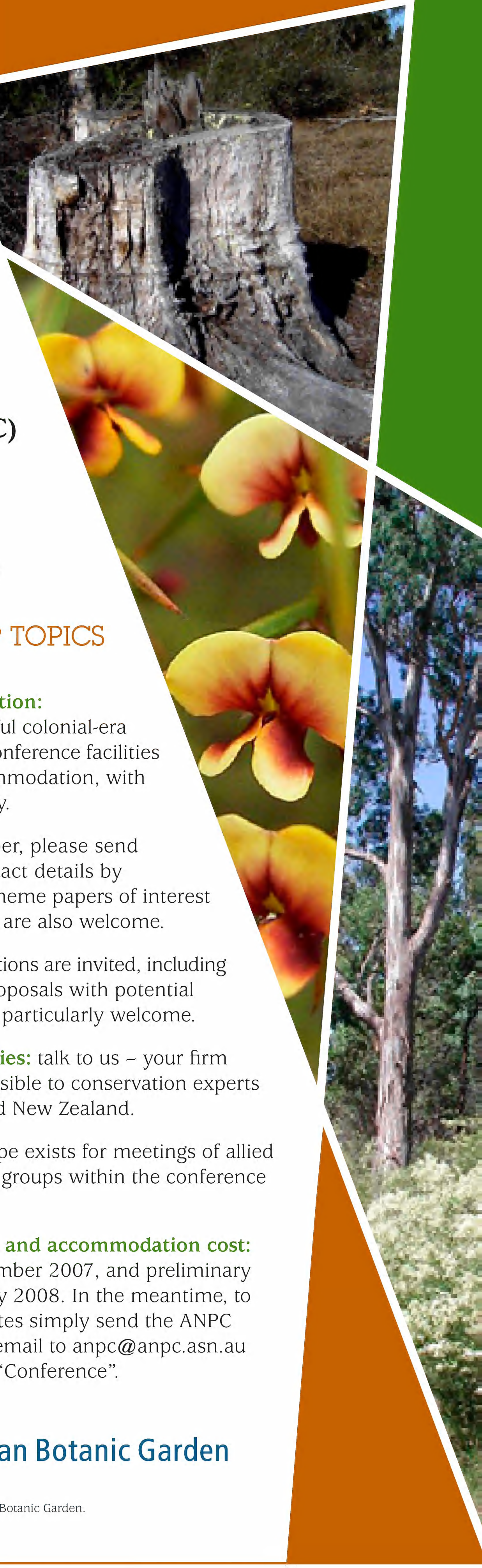
Our declining flora

TACKLING THE THREATS

Australian Network for Plant Conservation Inc (ANPC)

7th National Conference

Monday 21 – Thursday 24 April 2008
Location: Mulgoa NSW (near Penrith, western Sydney)



FIRST NOTICE & CALL FOR PAPERS AND WORKSHOP TOPICS

The ANPC and Mount Annan Botanic Garden invite you to a conference on threatening processes in plant conservation.

Threatening processes include human factors like land-clearing, fire mismanagement, and poor planning, geophysical ones like climate change, and biological ones like invasive weeds, animals and pathogens. They interact and operate at the smallest of local scales up to landscape level.

Tackling threatening processes is essential, whether for local patch preservation, threatened species management or whole-landscape protection. It requires pooling the best available science and practical experience.

This conference will bring together scientists, conservation managers and on-ground practitioners to demonstrate and discuss techniques for managing threats, share experience and identify knowledge gaps.

Papers, workshops and field trips will present the latest science and case studies from Australia and New Zealand.

Venue and accommodation: 'Winbourne' is a delightful colonial-era property, with modern conference facilities and budget-priced accommodation, with many alternatives nearby.

Papers: to present a paper, please send an abstract and full contact details by **15 February 2008**. Off-theme papers of interest to plant conservationists are also welcome.

Workshop topics: suggestions are invited, including off-theme. Developed proposals with potential presenters identified are particularly welcome.

Sponsorship opportunities: talk to us – your firm or organisation will be visible to conservation experts from across Australia and New Zealand.

Ancillary meetings: scope exists for meetings of allied organisations or interest groups within the conference - contact us to discuss.

Conference registration and accommodation cost: details available in November 2007, and preliminary program from 30 January 2008. In the meantime, to receive conference updates simply send the ANPC your contact details (by email to anpc@anpc.asn.au if possible) with subject "Conference".

Mount Annan Botanic Garden

Photos: Lotte von Richter, Mount Annan Botanic Garden.

Australasian Plant Conservation

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